A Report to Congress

Impacts of Reductions in Government Impelled Cargo on the U.S. Merchant Marine

U.S. Department of Transportation

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April 21, 2015

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EXECUTIVE SUMMARY

The Consolidated Appropriations Act, 2014, P.L. 113-76 requires the Maritime Administrator to submit a report to the House and Senate Committees on Appropriations detailing the current and future impacts of reductions in government impelled ("preference") cargo on the U.S. Merchant Marine as a result of changes to cargo preference requirements included in the Bipartisan Budget Act of 2013, the Moving Ahead for Progress in the 21st Century Act (MAP–21), the historical reductions in the P.L. 480 title II Food for Peace program, and the winding down of the wars in Iraq and Afghanistan.

This report fulfills this requirement from Congress. It develops a history of preference cargo volumes moved by U.S.-flag vessels operating in international trades and compares these flows and other data to historical trends of U.S.-flag privately-owned commercial vessel numbers. It develops a quantitative relationship between preference cargo volumes and vessel numbers. This relationship is used to estimate the impact of declines in preference cargoes on U.S.-flag fleet size and mariner employment. The analysis and projections in this report do not consider any proposed changes to Federal programs that generate preference cargos.

To develop this report, the Maritime Administration (MARAD) examined prior studies on this topic and studied the trends in cargo preference shipments during the period from 1990 through 2013.[1] MARAD was only able to obtain consistent data on cargo preference shipments back to 1990.[2] Since 1990, the number of U.S.-flagged liners, the largest category of U.S.-flag vessels, in international trade declined from 151 to 73 by the end of 2014. Within this period, the liner fleet dropped steadily to 79 vessels by 2000. The fleet then increased and stabilized, with 94 vessels in 2011, and thereafter declined again to its present size of 73 at the end of 2014. Over the 24 year period, the amount of government-impelled cargo carried on liners varied between roughly 5.6 and 2.2 million tons. The peak level was in 1991 (0.6 tons above the maximum attained in 1990, the next highest year), and the level in all years after 1994 was 3.8 million tons or less. Over the last three years of this period, liner preference cargos have declined from 2.9 to 2.2 million tons. The majority of the decline has been in Department of Defense (DOD) cargoes. Food Aid shipments, the second-largest source of preference cargos, also varied over this period,

[1] Preference cargo data were available through 2013, so the quantitative analysis covers 1990-2013. Other data presented in this report, its tables and charts, were available through 2014.

[2] Obtaining consistent data for this report required a significant amount of time and resources. The sources ranged from historical hard copy aggregate reports to transaction level data in electronic format. The data that MARAD gathered were in a heterogeneous format with regard to both source and within series from the same source.

and declined during the last three years. Of note is that during the last year of the period, 2013, the Federal budget sequester was enforced under the Budget Control Act of 2011 (P.L. 112-25). In 2012, the year immediately before sequestration, 2.3 million tons of government-impelled cargo were carried on liners. Roughly 10 of the 12 months in fiscal year 2012 were under the 75 percent carriage requirement for food aid cargoes that was in place between 1985 and July 2012.[3]

Carriers who have reflagged or retired ships out of the U.S.-flag fleet during the last three years have stated that the predominate driver in their decision to remove vessels has been the loss of preference cargoes. This report modeled a variety of factors that may have impacted the number of vessels in the U.S.-flag fleet. The statistically significant factors identified that were correlated with the fleet size were the availability of preference cargo and financial support from the Operating Differential Subsidy (ODS). Given limitations with the available data, it is not possible to precisely determine how much of the most recent decline is statistically associated with the loss of preference cargo. A substantial portion of the trends in fleet size cannot be statistically explained. Other factors that may have contributed to the decline in the size of the U.S.-flag fleet include ship size and age. This report analyzed these factors, but could not demonstrate a definite connection between these factors and fleet size.

This report focuses mainly on the impact of cargo preference on the U.S.-flag international trading fleet, which consists primarily of large, self-propelled ships owned by private companies and crewed with U.S. merchant mariners. Although coastwise tanker and offshore supply segments of the Jones Act trade have been growing in recent years, the number of ships in Jones Act trade that provide service for Hawaii, Guam, Puerto Rico and Alaska has been in decline. Additionally, Jones Act-eligible vessels do not rely on government-impelled preference cargoes for their commercial success. However, these vessels are crewed by U.S. merchant mariners who could be drawn upon to support U.S. military requirements, if necessary because they possess a U.S. Coast Guard Merchant Mariner Credential with unlimited ocean and tonnage endorsement.[4]

Due to the different types of preference cargo providing support to the U.S. flag international trading fleet, these trends are divided into three distinct groups: non-bulk dry cargo, dry bulk cargo, and liquid bulk cargo. Non-bulk dry cargoes are typically carried by "liner-type" vessels that typically move cargo on fixed trade routes in containers, trailers, packages, or discrete units. Such vessels typically consist of containerships, Roll-On/Roll-Off (Ro/Ro) vessels and general cargo ships. Dry and liquid bulk cargoes are typically carried on charter contracts by dry bulk ships and tankers, respectively.[5] The overall trend for U.S.-flag ships operating in international

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[3] P.L. 112 -141, which reduced the cargo preference share from 75 percent of food aid tonnage shipped by ocean enacted in 1985 to the pre-1985 level of 50 percent enacted on July 6, 2012. Reimbursements that food aid agencies received for the additional costs of the 1985 increased cargo preference requirement were eliminated in the Bipartisan Budget Act of 2013.

[4] A list of all U.S.-flag Privately-Owned Oceangoing, Self-Propelled, Cargo-Carrying vessels of 1,000 gross tons and above is located in Appendix II of the full report.

[5] For the purposes of this report, vessel types are defined as follows: d*ry bulk carrier* means any self-propelled vessel in which the majority of its cargo carrying capacity is designed to carry homogenous, unmarked, non-liquid cargo, notwithstanding the actual cargo being transported; *tanker* means any vessel in which the majority of its

trades is shown in Figure E1. The decline in the overall number of vessels also corresponds roughly to an increase in the size of each vessel and a reduction in the number of mariners required to crew each vessel. Since 1990, the average deadweight tonnage that a vessel can carry has increased by 67 percent for containerships (47 percent for all liners) and 14 percent for dry bulk vessels. The average tonnage that tankers and general cargo vessels can carry has declined by 66 percent and 23 percent, respectively. The number of mariners required per vessel currently averages about 20 billets (or 40 mariners per year) compared to about 32 billets or 67 mariners per vessel in the 1990s.

Overall volumes of non-bulk dry cargo and dry bulk preference cargo in international trade are lower than the levels reached in the early 1990s, a period of peak preference cargo shipping associated with surplus commodities and the fall of the former Soviet Union, though they are currently roughly at the same levels that they were in the late 1990s. There were some increases in DOD dry cargo volumes during portions of the decade following 2000; however, since 2010 volumes have declined by 42 percent from 2010 for non-bulk dry cargo and 56 percent for dry bulk food aid. Liquid bulk cargoes are up from 2010 levels, but are down from a decade ago, and in any case employ a comparatively small number of vessels.

Reductions in the size of the U.S. Armed Forces and the ending of overseas military actions suggest that military cargoes are likely to continue to trend downward until 2016, then plateau at an estimated level under one million metric tons per year. Food aid levels are hard to predict in part because of changing commodity prices. Recent reductions in P.L. 480 Title II appropriations, the MAP-21 change to the U.S.-flag share of total food aid tonnage shipped by ocean to at least 50 percent of the total (in FY 2013, the U.S. flag exceeded the minimum with 63 percent of the total), suggest lower food aid volumes in the future depending on how variable food prices are, with price increases reducing the volume of both bulk and packaged commodities that can be purchased with any given budget. However, forecasting food aid prices, the scope and location of future emergencies, and the commodity mix that will best address them - and therefore the tonnage that could be purchased with a given budget - is inherently difficult.

The U.S.-flag fleet of domestic trading oceangoing vessels has also been in decline since 1990 as shown in figure E2. The number of liner type vessels in the fleet had increased in the late 1990s largely due to ships built with Construction Differential Subsidies becoming eligible to participate in domestic trade when reaching 25 years of age. The decline in the number of tanker and bulk vessels is likely due to changes in the domestic markets and strict regulation of petroleum tankers under the Oil Pollution Act of 1990. Although this segment of the U.S.-flag

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cargo carrying capacity is designed to carry hydrocarbon products or other bulk liquid cargoes, notwithstanding the actual cargo being transported; d*ry cargo liner* is the residual vessel type encompassing all cargo vessels which are not “dry bulk carriers” or “tankers,” exemplified by and including, but not limited to, container-carrying vessels, roll-on/roll-off (Ro/Ro) vessels, LASH (lighter-aboard-ship) vessels, and general cargo or break-bulk vessels (vessels that carry packaged, but non-unitized, shipments of all shapes, sizes and weights). In this context, the term “liner” is used as a physical vessel type and is not a reference to the trade or service in which a vessel is engaged.

fleet does not depend on government-impelled cargoes, the crews of these vessels are fully qualified to operate sealift ships in the Government reserve fleet.

Figure E1: Trend in U.S.-Flag International Trading Self-Propelled Oceangoing Vessels

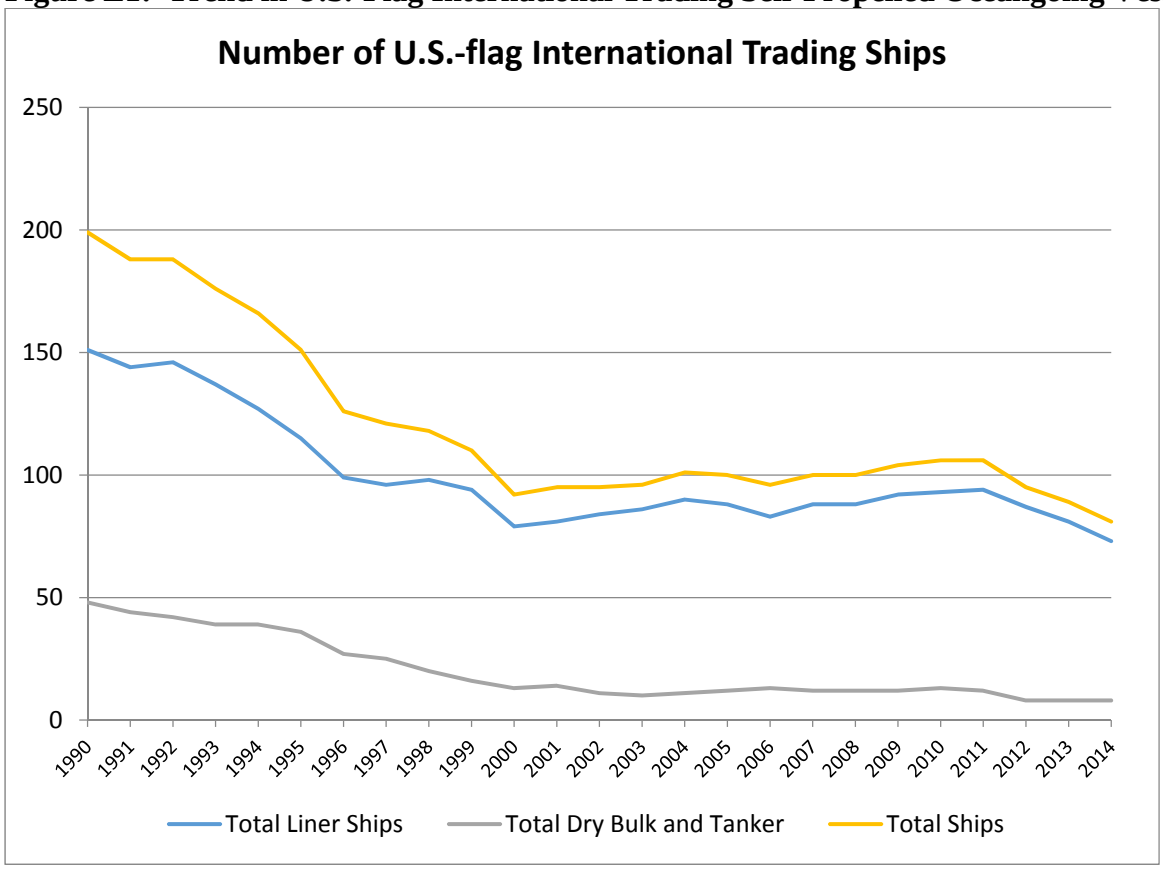
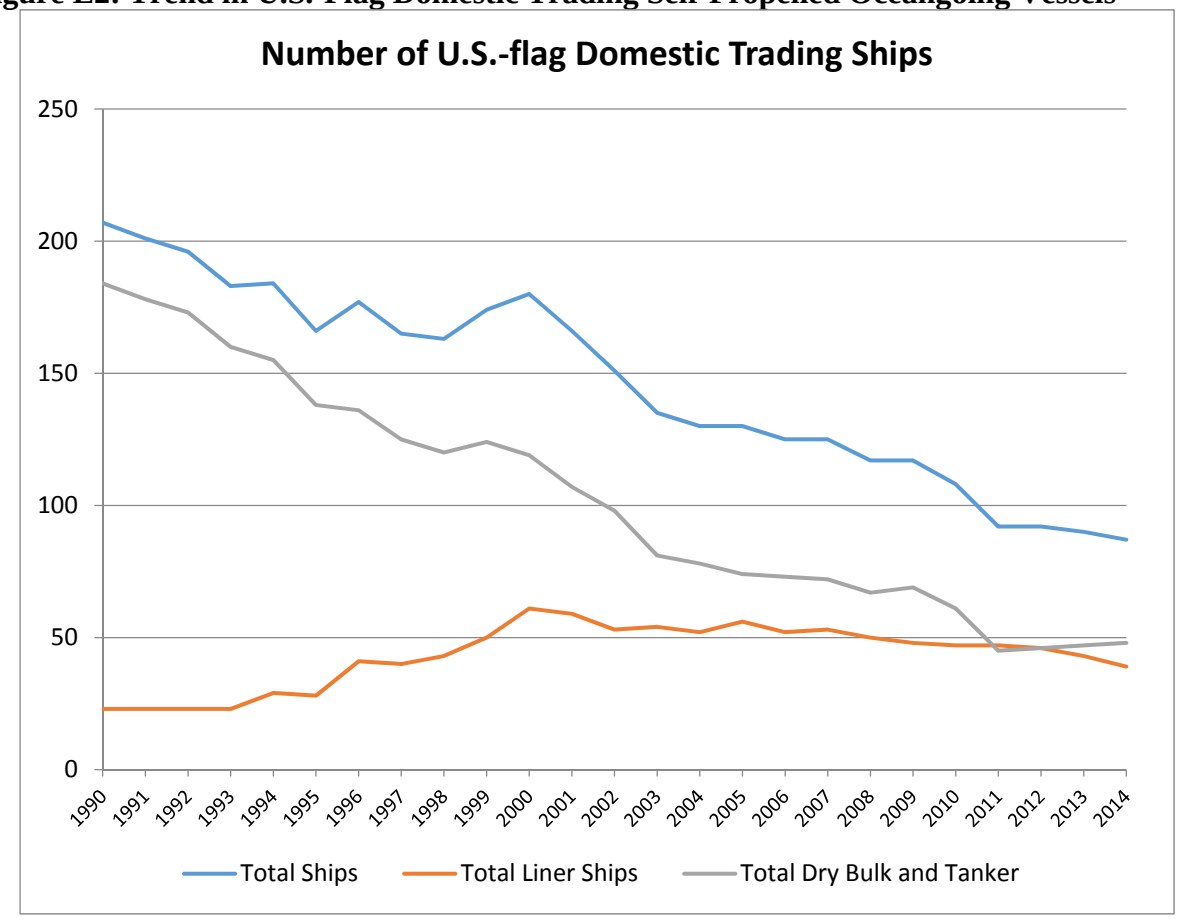


Figure E2: Trend in U.S.-Flag Domestic Trading Self-Propelled Oceangoing Vessels



This report studied critical factors influencing employment for the U.S.-flag fleet of privately-owned oceangoing vessels engaged in international trade. Among the factors evaluated were volumes of preference cargo moved on U.S.-flag vessels since 1990, numbers of vessels under ODS or Maritime Security Program (MSP) contracts, numbers of vessels under Military Sealift Command (MSC) long-term charters, and U.S.-flag vessel sizes and ages. This report used statistical tools and conducted sensitivity analysis to measure the relationships of some of these factors to historical fleet size. Factors emphasized in the statistical analysis include cargo volumes and vessels with MSP and ODS contracts. Other factors may also influence vessel retention, such as vessel age, vessel size, and specialized vessel use. Based on the analysis, the report identified the decrease in available Government-impelled cargo as the most significant factor contributing to the loss of vessels. Accordingly, analysis showed no strong influence from other factors examined.

While our quantitative analysis using data from 1990 through 2013 shows a projected decline of 3 U.S.-flag liners from 79 at the end of 2014 to 76 by 2023, the actual number of U.S. – flag liners in the fleet at the end of 2014 was already at 73. The analysis also shows a decline in total private-owned self-propelled vessels (liners dry bulk carriers, and tankers) in international trade from a predicted 87 (end 2013) to 84 in total through 2023, which is slightly lower than the levels before the wars in Iraq and Afghanistan. Based on the 95% confidence interval for the quantitative analysis, the range in 2023 is 64 to 110 total private-

owned self-propelled vessels. The number of mariner jobs associated with the loss of 3 ships is approximately 120 mariners. It is important to note that the actual number of privately-owned self-propelled vessels in international trade at the end of 2014 was 81, and the net decline of international 25 trading vessels that left the fleet during the period between the end of 2010 and the end of 2014 represents roughly 1,000 mariner jobs. Prior to 2010, vessel numbers had remained at or above 100 in all years except 2007. A decline in the fleet will be felt most acutely by vessels in liner service because they are most reliant on DOD preference cargoes, and because the dry-bulk charter fleet currently contains only three vessels. Reductions in the MSP fleet of liner-type vessels are possible, but we expect other carriers would show interest in filling available MSP slots.

Due to extensive training and licensing requirements for deck and engineering officer positions, it is difficult to recruit and retain seafarers if there are insufficient jobs. Similarly, based on U.S. Coast Guard data and commercial crewing practices, those mariners who are not actively sailing are unlikely to remain current in licensing and training. This applies to mariners subject to international training requirements.

MARAD is currently developing a National Maritime Strategy that will propose a comprehensive range of actions to preserve and grow all aspects of the U.S. Merchant Marine, including the U.S.-flag international trading fleet. The strategy is all the more important due to continued decline in number of vessels in the international trading fleet and the critical role this fleet currently plays in providing the vessels and mariners needed by our Nation's DOD surge and sustainment requirements. Short of comprehensive change to maritime policy, the trend that has continued since the end of World War II will continue to reduce the size of the U.S. flag fleet in international trade and ability of the United States to remain influential as a global participant in maritime shipping.

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INTRODUCTION

The Consolidated Appropriations Act, 2014, P.L. 113-76, specifies that:

> "The [Maritime] Administrator shall submit a report to the House and Senate Committees on Appropriations within 90 days of the date of enactment of this Act detailing the current and future impacts of reductions in government impelled cargo on the U.S. Merchant Marine as a result of changes to cargo preference requirements included in the Bipartisan Budget Act of 2013, the Moving Ahead for Progress in the 21st Century Act (MAP-21), the historical reductions in the P.L. 480 title II Food for Peace program, and the winding down of the wars in Iraq and Afghanistan…"

This report is intended to fulfill this request. It begins with a background discussion of the cargo preference programs and recent events that may affect future cargo preference volumes.[6] It develops a history of preference cargo volumes moved by U.S.-flag vessels and compares these data to historical trends of U.S.-flag vessel numbers. Finally, it uses the historical relationship of preference cargo volumes and vessel numbers to evaluate the impact of forecasted preference cargo volumes on future U.S.-flag fleet size and mariner employment.

BACKGROUND

U.S. cargo preference laws and agreements help sustain the U.S.-flag fleet. These laws require that a prescribed share of U.S. Government-impelled cargoes to be transported on ocean vessels must be carried on privately-owned U.S.-flag commercial vessels, to the extent such vessels are available at fair and reasonable rates for commercial vessels of the United States.[7] For the purposes of cargo preference, U.S.-flag vessels are privately-owned commercial vessels documented and operated under the laws of the United States. The great majority of preference cargoes carried by U.S.-flag vessels are carried by vessels that serve the international trades. Coastwise and domestic waterborne trade is entirely reserved for the U.S.-flag under the Merchant Marine Act of 1920 ("Jones Act").[8]

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[6] For the purposes of this report, U.S.-flag vessels are privately-owned, size of 1,000 gross tons and over, and retained in the fleet for international trades.

[7] Per 46 U.S.C. § 55305, a government-impelled cargo is one that is owned, procured, furnished, or financed by the United States Government.

[8] Jones Act-eligible vessels, which serve domestic U.S. markets, do not rely heavily on preference cargoes for commercial success. Therefore, the fleet of interest in this report is the U.S.-flag international trading fleet, which

There are three primary cargo preference laws and agreements:

- The Cargo Preference Act of 1954 (1954 Act), as amended, requires that at least 50 percent of civilian agency ocean borne cargoes must be transported on U.S.-flag vessels.[9] The largest group of cargoes covered by this law is food aid cargoes, including cargoes under P.L. 480 Titles I, II, and III; Food for Progress; the McGovern-Dole International Food for Education and Child Nutrition program; and Section 416(b). However, a wide range of other civilian cargoes are also subject to cargo preference requirements, including cargoes from the Department of Energy, Department of Transportation, State Department, and other Federal agencies. The 1954 Act was amended in 1985[10] to require that 75 percent of certain agricultural commodities be carried on U.S.-flag vessels, but this amendment was repealed in July 2012 by MAP-21 and, thus, the percentage for agricultural commodities was revised back to 50 percent.[11]
- The Military Cargo Preference Act of 1904 (1904 Act) requires that only vessels of the United States or belonging to the United States may be used in the transportation by sea of supplies bought for the Army, Navy, Air Force or Marine Corps.[12] The 1904 Act effectively requires that 100 percent of military cargoes move on U.S.-flag vessels, although this 100 percent share is generally not realized because U.S.-flag ships may not be offered when needed, or be available at fair and reasonable rates for some cargoes. Military cargoes represent the largest and most important source of preference cargo for U.S.-flag carriers.
- Public Resolution No. 17 of the 73rd Congress (PR17) passed in 1934 provides that where an instrumentality of the Government makes any loans to foster the export of agricultural or other products, such products must be carried on vessels of the United States, to the extent of the agreement, unless MARAD certifies to the lending agency that such vessels are not available as to numbers, tonnage capacity, sailing schedule or at reasonable rates. PR17 is applicable to loans and certain credit guarantees of the Export-Import (EX-IM) Bank or other Government instrumentalities for the purpose of financing the acquisition and shipment of United States products or services.[13] This program accounts for the next largest share of cargoes after Department of Defense (DOD) and food aid cargoes.

Cargo preference laws do not require vessels carrying preference cargoes to be built in the United States. Registry under the U.S. flag is the key requirement. However, for civilian agency and food aid cargoes covered under the 1954 Act, the carrying vessel must be registered under the U.S. flag for at least three years before being eligible to carry the 1954 Act cargo. DOD and

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consists primarily of large, self-propelled ships owned by private companies and crewed with U.S. merchant mariners.

[9] 46 U.S.C. §§ 55305-55315.

[10] The Food Security Act of 1985, P.L. 99-198 (December 23, 1985).

[11] P.L. 112-141, July 6, 2012.

[12] 10 U.S.C. § 2631.

[13] 46 U.S.C. § 55304. Note: Services are included because U.S.-flag ocean transportation services could be incorporated into a Government finance package.

EXIM Bank cargoes are not bound by this three year waiting period as they are covered by the 1904 Act and PR17 respectively, and not by the 1954 Act.[14]

The DOD cargo preference law has played a key role in supporting the U.S.-flag fleet for more than a century, as has the main civilian cargo preference law for nearly 65 years In a report on the costs and effects of cargo preference laws issued in November 1994, the U.S. Government Accountability Office (GAO) estimated that at that time, cargo preference cost the U.S. Government an average of $579 million per year ($710 million per year for the Persian Gulf War period) above carriage on foreign-flag vessels, and concluded that, without preference cargo, the equivalent of up to two-thirds of U.S.-flag vessels engaged in international trade (by tonnage) would leave the fleet, despite ODS at levels intended to mitigate most of this disadvantage relative to foreign-flag competitors.[15] Of the vessels that rely most heavily on preference cargoes (intermodal,[16] general cargo and dry bulk ships), GAO estimated from 77 percent (intermodal vessels) to 96 percent (bulk ships) would leave the fleet without preference cargoes.[17] Today, as it was 20 years ago, U.S.-flag vessel owners remain very dependent on preference cargoes, despite direct partial assistance through Maritime Security Program (MSP) stipends. More information on this topic is provided in the following text.

CARGO PREFERENCE TRENDS

This section shows the trends in cargo preference during the period from 1990 through 2013. It is divided into two components: volumes of non-bulk dry cargo and volumes of bulk cargo. This distinction stems from the fact that different vessel types are supported by these cargo groups.

For this report on the impact of cargo preference on the U.S.-flag fleet, MARAD is providing mainly cargo tonnage information rather than cargo revenue data. Compliance with statutory cargo preference carriage requirements is based on shares of cargo tonnage carried rather than shares of overall revenues, and better historical data series therefore exist for tonnage. Tonnage data are generally available for all cargo preference categories over the last 24 years, whereas revenue data is available for only some programs and some years during this period. Revenue data are difficult to standardize and compare across cargo categories—military cargo

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[14] 46 U.S.C. § 55305(a). Also, the three year requirement for 1954 Act cargoes does not apply to vessels in the MSP.

[15] GAO assumed that ODS alone, in the absence of cargo preference laws, does not fully offset the higher costs of operating U.S.-flag vessels in international trade. GAO found that costs are higher, in part, because some crew costs are not covered by ODS subsidies; ODS recipients were restricted from operating in domestic trade; and in the case of liner services, they were restricted to operation in certain geographic areas; also, ODS recipients faced higher administrative costs than foreign carriers. See U.S. Government Accountability Office (then U.S. General Accounting Office). MARITIME INDUSTRY: Cargo Preference Laws—Estimated Costs and Effects, GAO/RCED-95-34. November 1994, pp. 3 and 56-57 *available at* http://www.gao.gov/assets/160/154784.pdf

[16] An intermodal vessel carries cargo that can be transferred between ship, rail, or truck without being repacked. These are typically container and Ro/Ro ships.

[17] GAO Ibid, pp. 25-32.

revenues may reflect extensive intermodal services that are not present for other cargoes. Table 1 shows the available data for total U.S.-flag revenue and percentages for DOD, food aid and other civilian agencies over this period. It is important to note that revenue does not indicate profitability.

Table 1 Cargo Preference U.S.-flag Revenue 1990 to 2013

Calendar/Fiscal Year	Food Aid ($1,000)	Civilian ($1,000)	Military ($1,000)	Total U.S.-Flag ($1,000)	Food Aid	Civilian	Military
CY 1991	$467,307	$103,319	N/A	N/A	N/A	N/A	N/A
CY 1992	$557,286	$91,958	N/A	N/A	N/A	N/A	N/A
CY 1993	$625,318	$174,901	N/A	N/A	N/A	N/A	N/A
CY 1994	$367,217	$116,512	N/A	N/A	N/A	N/A	N/A
CY 1995	$220,836	$86,103	N/A	N/A	N/A	N/A	N/A
CY 1996	$192,025	$112,351	N/A	N/A	N/A	N/A	N/A
CY 1997	$206,845	$163,285	N/A	N/A	N/A	N/A	N/A
CY 1998*	$368,902	$100,992	N/A	N/A	N/A	N/A	N/A
FY 1999*	$621,403	$84,375	N/A	N/A	N/A	N/A	N/A
FY 2000	$513,774	$82,121	N/A	N/A	N/A	N/A	N/A
FY 2001	$454,792	$47,158	N/A	N/A	N/A	N/A	N/A
FY 2002	$426,626	$95,536	N/A	N/A	N/A	N/A	N/A
FY 2003	$465,358	$78,735	N/A	N/A	N/A	N/A	N/A
FY 2004	$454,938	$71,389	$874,250	$1,400,577	32%	5%	62%
FY 2005	$379,395	$76,097	$857,668	$1,313,160	29%	6%	65%
FY 2006	$414,403	$110,580	$784,849	$1,309,832	32%	8%	60%
FY 2007	$319,760	$81,541	$919,365	$1,320,666	24%	6%	70%
FY 2008	$428,859	$81,902	$1,207,526	$1,718,287	25%	5%	70%
FY 2009	$422,777	$96,776	$1,642,196	$2,161,749	20%	4%	76%
FY 2010	$336,770	$114,447	$1,801,199	$2,252,416	15%	5%	80%
FY 2011	$267,240	$116,234	$2,030,946	$2,414,420	11%	5%	84%
FY 2012**	$299,910	N/A	N/A	N/A	N/A	N/A	N/A
FY 2013	$180,493	N/A	N/A	N/A	N/A	N/A	N/A

Source: MARAD annual reports and MARAD Office of Cargo Preference. The figures presented here may reflect newer information and could differ from prior published sources.
Note: Only U.S.-flag revenues are available. Total revenues (U.S. and foreign-flag) are not available. The Military figures for FY 2012 and FY 2013 are under review by the U.S. Army Military Surface Deployment and Distribution Command (SDDC) and are not available at the time of this report.
* Note that there was a change in the reporting from a calendar year to a fiscal year between 1998 and 1999. Therefore the last 3 months of calendar year 1998 are also included in the fiscal year 1999 data, which covers October 1, 1998 to September 30, 1999.
** P.L. 112 -141, which reduced the cargo preference share on food aid tonnage shipped by ocean from the 75 percent enacted in 1985 to the pre-1985 level of 50 percent was enacted on July 6, 2012. Reimbursements that food aid agencies received for the additional costs of the 1985 increased cargo preference requirement were eliminated in the Bipartisan Budget Act of 2013.

Non-Bulk Dry Cargo: Table 2 provides a 24-year history of U.S.-flag vessel movements of non-bulk dry preference cargo. Typically, these cargoes are carried by so-called "liner-type" vessels that move cargo in containers, trailers, packages or discrete units usually on established

schedules and trade lanes[18]. Such vessels typically consist of containerships, Ro/Ro vessels and general cargo ships. Figure 1 illustrates how the tonnage of non-bulk dry preference cargoes carried on U.S.-flag ships since 1990 has fluctuated over time due to various factors. In the 1990s, the overall trends of packaged food aid, DOD cargo and civilian cargo were downward, most markedly for military cargoes because of diminished sustainment sealift post-Operation DESERT STORM. Then, beginning around 1999 for food aid and 2003 for DOD cargo, non-bulk dry cargo shipments began to increase, largely to support Russian grain needs and U.S. military activities in Iraq and Afghanistan, respectively. Thereafter, particularly from 2004 onward, food aid approached the levels of the late 1990s, while military cargoes to support the war effort returned to the levels of the early 1990s. The lowest total tonnage over this period was 1998, even counting 2013, during which sequestration was enforced under the provisions of the Budget Control Act of 2011 (PL 112-25). While the total volume had increased to over 3 million metric tons in 2003, by 2012, the volume was 7 percent above the 1998 level and in 2013, when sequestration was enforced, the overall volume was 3 percent above the 1998 level. However, in 2012, prior to the 2013 sequestration, the volume of food aid preference cargo was at its lowest level at any time during the entire period from 1990-2012.

In the analysis to follow, MARAD does not attempt to allocate specific types of non-bulk dry cargo (such as DOD cargo or packaged food aid cargo) to specific types or groupings of vessels (such as containerships). Dry bulk carriers mainly transport food aid preference cargoes and do not participate in DOD contracting, but most others, such as containerships or general cargo ships, may transport various mixes of DOD, food aid and other civilian agency preference cargoes. For instance, 26 liner-type vessels in the MSP carried food aid during 2013 though this was generally a small portion of MSP vessels' carriage overall and by voyage.[19] Alternatively, non-MSP liner-type vessels often carry DOD cargoes in addition to food aid and other civilian cargoes. Creating a detailed breakout of DOD and food aid cargoes carried by individual vessels and vessel types would also be very time consuming, particularly for a time series of multiple years.[20] Therefore, MARAD summed the quantities of non-bulk dry cargo into one total for each year in its evaluation of cargoes for liner-type vessels. In addition, some DOD data included in this report may include cargo carried on foreign-flag ships.

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[18] For the purposes of this report, vessel types are defined as follows: dry bulk carrier means any self-propelled vessel in which the majority of its cargo carrying capacity is designed to carry homogenous, unmarked, non-liquid cargo, notwithstanding the actual cargo being transported; tanker means any vessel in which the majority of its cargo carrying capacity is designed to carry hydrocarbon products or other bulk liquid cargoes, notwithstanding the actual cargo being transported; dry cargo liner is the residual vessel type encompassing all cargo vessels which are not "dry bulk carriers" or "tankers," exemplified by and including, but not limited to, container-carrying vessels, Ro/Ro vessels, LASH (lighter-aboard-ship) vessels, and general cargo or break-bulk vessels (vessels that carry packaged, but non-unitized, shipments of all shapes, sizes and weights). In this context, the term "liner" is used as a physical vessel type and is not a reference to the trade or service in which a vessel is engaged

[19] U.S. Department of Transportation, Maritime Administration, Cargo Preference Overview System (CAPOS) database.

[20] MARAD does not believe that such data are available for many years of the analysis period used in this report.

Table 2: Volumes of Non-Bulk Dry Preference Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons)

Year	Food Aid (Packaged)	Civilian Agencies	DOD*	Total
1990	1,048,000	1,038,000	2,910,000	4,996,000
1991	1,371,000	299,000	3,950,000	5,620,000
1992	1,048,000	205,000	2,099,000	3,352,000
1993	1,371,000	1,430,000	1,944,000	4,745,000
1994	1,624,000	359,000	1,648,000	3,631,000
1995	936,000	265,000	1,610,000	2,811,000
1996	750,000	324,000	1,408,000	2,482,000
1997	856,000	473,000	1,437,000	2,766,000
1998	635,000	311,000	1,217,000	2,163,000
1999	1,379,000	231,000	1,334,000	2,944,000
2000	1,493,000	234,000	992,000	2,719,000
2001	1,186,000	292,000	969,000	2,447,000
2002	1,551,000	346,000	1,090,000	2,987,000
2003	1,540,000	222,000	1,677,000	3,439,000
2004	1,555,000	242,000	1,948,000	3,745,000
2005	1,037,000	126,000	2,144,000	3,307,000
2006	956,000	123,000	1,990,000	3,069,000
2007	780,000	120,000	2,422,000	3,322,000
2008	710,000	90,000	2,169,000	2,969,000
2009	915,000	119,000	2,574,000	3,608,000
2010	1,000,000	115,000	2,710,000	3,825,000
2011	613,000	153,000	2,171,000	2,937,000
2012**	493,000	217,000	1,613,000	2,323,000
2013 (sequester)	379,000	200,000	1,651,000	2,230,000

* For consistency with historical and forecast data, DOD figures may include some cargo carried on foreign-flag ships.

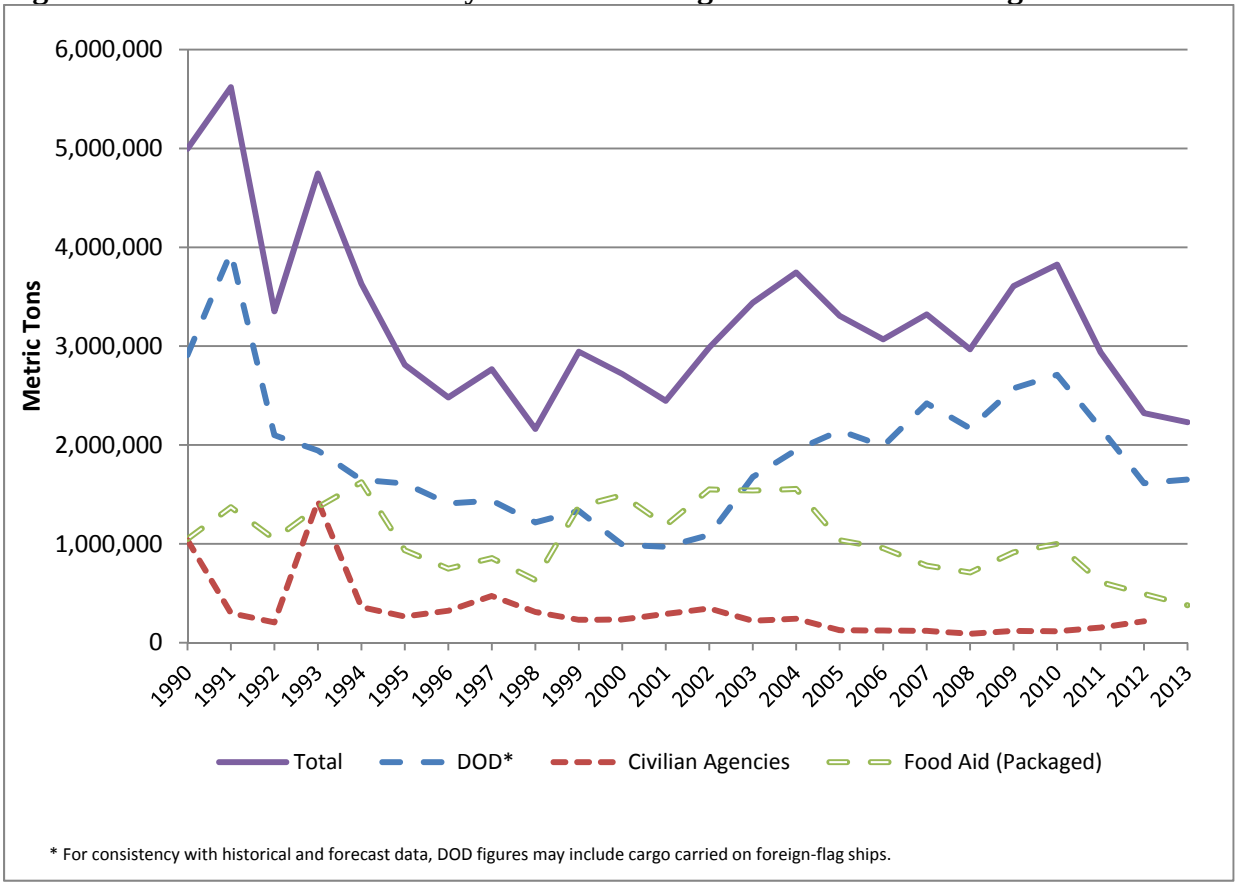
** P.L. 112 -141, which reduced the cargo preference share on food aid tonnage shipped by ocean from 75 percent enacted with the Food Security Act of 1985, P.L. 99-198 to the pre-1985 level of 50 percent was enacted on July 6, 2012. Reimbursements that food aid agencies received for the additional costs of this increased cargo preference requirement were eliminated in the Bipartisan Budget Act of 2013.

Table 3: Volumes of Non-Bulk Dry Preference Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Annual Percentage Change)

Year	Food Aid (Packaged)	Civilian Agencies	DOD*	Total
1990	-	-	-	-
1991	31%	-71%	36%	12%
1992	-24%	-31%	-47%	-40%
1993	31%	598%	-7%	42%
1994	18%	-75%	-15%	-23%
1995	-42%	-26%	-2%	-23%
1996	-20%	22%	-13%	-12%
1997	14%	46%	2%	11%
1998	-26%	-34%	-15%	-22%
1999	117%	-26%	10%	36%
2000	8%	1%	-26%	-8%
2001	-21%	25%	-2%	-10%
2002	31%	18%	12%	22%
2003	-1%	-36%	54%	15%
2004	1%	9%	16%	9%
2005	-33%	-48%	10%	-12%
2006	-8%	-2%	-7%	-7%
2007	-18%	-2%	22%	8%
2008	-9%	-25%	-10%	-11%
2009	29%	32%	19%	22%
2010	9%	-3%	5%	6%
2011	-39%	33%	-20%	-23%
2012	-20%	42%	-26%	-21%
2013 (sequester)	-23%	-8%	2%	-4%

* For consistency with historical and forecast data, DOD figures may include some cargo carried on foreign-flag ships.

Figure 1: Trends in Non-Bulk Dry Preference Cargo Carried on U.S.-Flag Vessels*



DOD cargo has returned to pre-2000 levels. More than any other factor in this report, we anticipate that this factor will impact the U.S.-flag fleet both now and in the foreseeable future. In addition to the drawdown associated with the ending of the Iraq and Afghanistan wars after 2010, the United States has been pursuing a sustained drawdown in its overseas forces since the end of the Cold War in the 1990s.

According to DOD, the American military presence in Europe as of 2014 is 86 percent smaller than it was in 1989, with the closing of over 700 sites including hundreds of bases and radio and radar positions.[21] Recently, the Administration announced plans to reduce the U.S. Armed Forces to its lowest level since before the World War II.[22]

Food aid programs ship bulk (mostly dry, but some liquid) and packaged commodities. In metric tons, the cargo volume for packaged food aid is much smaller than dry bulk. Food aid volumes often change significantly from year to year, making trends are hard to characterize and forecast.

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[21] Headquarters, United States Army Europe, Office of the Chief of Public Affairs (OCPA), Fact Sheet, (March 27, 2014): http://www.eur.army.mil/pdf/USAREURTransformation.pdf.
[22] Claudette Roulo, "Acting Deputy Secretary Outlines Defense Budget Priorities," DoD News (Feb. 25, 2014): http://www.defense.gov/news/newsarticle.aspx?id=121719.

Food aid quantities are affected by appropriations levels, food prices, the location and timing of emergencies and other programs, and the commodity mixes required to address need. In 2012, Congress, through MAP-21, returned the minimum share of food aid tonnage to be carried on U.S.-flag vessels from 75 percent to its pre-1985 share of 50 percent, which we expect to have an impact on volumes of food aid carried on U.S.-flag vessels since 2012.[23] In 2013, the Bipartisan Budget Act of 2013 also eliminated the reimbursements paid by MARAD to the food aid programs appropriated to U.S. Department of Agriculture (USDA) for higher costs associated with the use of U.S.-flag vessels to ship food aid cargoes.[24] USAID and USDA had previously used these reimbursements (estimated at $75 million per year under MAP-21[25]) to purchase and transport additional food aid.

Civilian agency cargoes other than food aid have also varied substantially from year to year and since 2004 have been below the levels of the prior years in our data series. Civilian agency cargoes constitute a relatively small share of total non-bulk dry cargo by tonnage. Some civilian cargoes rely on specialized ships, particularly general cargo ships that periodically carry EX-IM Bank-financed project cargo.

Bulk Cargo: Table 4 provides a 24 year history of U.S.-flag vessel movements of dry and liquid bulk preference cargoes. Typically, these cargoes are carried by dry bulk ships and tankers, respectively, although some tankers will carry dry bulk cargoes on occasion. Figure 2 shows the tonnage of bulk preference cargoes U.S.-flag ships since 1990 over time. Dry bulk ships are used almost exclusively for food aid programs, while DOD and other civilian agencies ship some liquid bulk cargoes. Tonnage has fluctuated from year to year, but has been in the 4-5 million ton range for most years since 1995. Bulk food aid and liquid military and civilian bulk cargo in 2010-2012 were roughly at the same level as in the late 1990s.

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[23] Because 2013 data include the impact of the 2013 sequestration, and the 2014 data --which would include the impact of the elimination of cargo preference reimbursements --are not available, we cannot isolate the impact of MAP-21.

[24] P.L. 113–67—December 26, 2013. Section 602, Transportation Cost Reimbursement, http://beta.congress.gov/113/plaws/publ67/PLAW-113publ67.pdf.

[25] CQ's House Action Reports, Fact Sheet: Bipartisan Budget Agreement, No. 113-17/December 11, 2013, p. 14, http://assets.listpilot.net/afa/files/Bipartisan_Budget_Act.pdf.

Table 4: Volumes of Cargo Preference Bulk Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons and Percent)

Year	Food Aid (Dry Bulk)	Pct.	Civilian Agencies (Liquid Bulk)	Pct.	DOD* (Liquid Bulk)	Pct.	Total U.S. Flag	Pct.
1990	3,865,000	34%	680,000	6%	6,976,000	61%	11,521,000	100%
1991	4,725,000	44%	117,000	1%	5,896,000	55%	10,738,000	100%
1992	4,557,000	53%	376,000	4%	3,696,000	43%	8,629,000	100%
1993	4,690,000	52%	574,000	6%	3,842,000	42%	9,106,000	100%
1994	4,515,000	49%	588,000	6%	4,179,000	45%	9,282,000	100%
1995	1,795,000	33%	319,000	6%	3,329,000	61%	5,443,000	100%
1996	1,323,000	28%	321,000	7%	3,085,000	65%	4,729,000	100%
1997	1,381,000	29%	287,000	6%	3,027,000	64%	4,695,000	100%
1998	1,186,000	26%	253,000	6%	3,048,000	68%	4,487,000	100%
1999	4,982,000	43%	379,000	3%	6,105,000	53%	11,466,000	100%
2000	3,262,000	37%	478,000	5%	5,087,000	58%	8,827,000	100%
2001	3,157,000	36%	415,000	5%	5,252,000	60%	8,824,000	100%
2002	2,814,000	49%	373,000	7%	2,551,000	44%	5,738,000	100%
2003	2,186,000	24%	435,000	5%	6,395,000	71%	9,016,000	100%
2004	1,624,000	29%	383,000	7%	3,608,000	64%	5,615,000	100%
2005	1,510,000	23%	331,000	5%	4,868,000	73%	6,709,000	100%
2006	1,702,000	25%	354,000	5%	4,866,000	70%	6,922,000	100%
2007	1,327,000	25%	324,000	6%	3,581,000	68%	5,232,000	100%
2008	1,265,000	48%	350,000	13%	1,024,000	39%	2,639,000	100%
2009	1,752,000	45%	364,000	9%	1,768,000	46%	3,884,000	100%
2010	1,580,000	38%	383,000	9%	2,241,000	53%	4,204,000	100%
2011	659,000	15%	342,000	8%	3,385,000	77%	4,386,000	100%
2012	1,103,000	22%	427,000	9%	3,481,000	69%	5,011,000	100%
2013 (sequester)	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
Avg.	2,402,125	35%	381,375	6%	3,928,750	59%	6,712,250	100%

* For consistency with historical and forecast data, DOD figures may include liquid bulk cargo carried on foreign-flag ships.

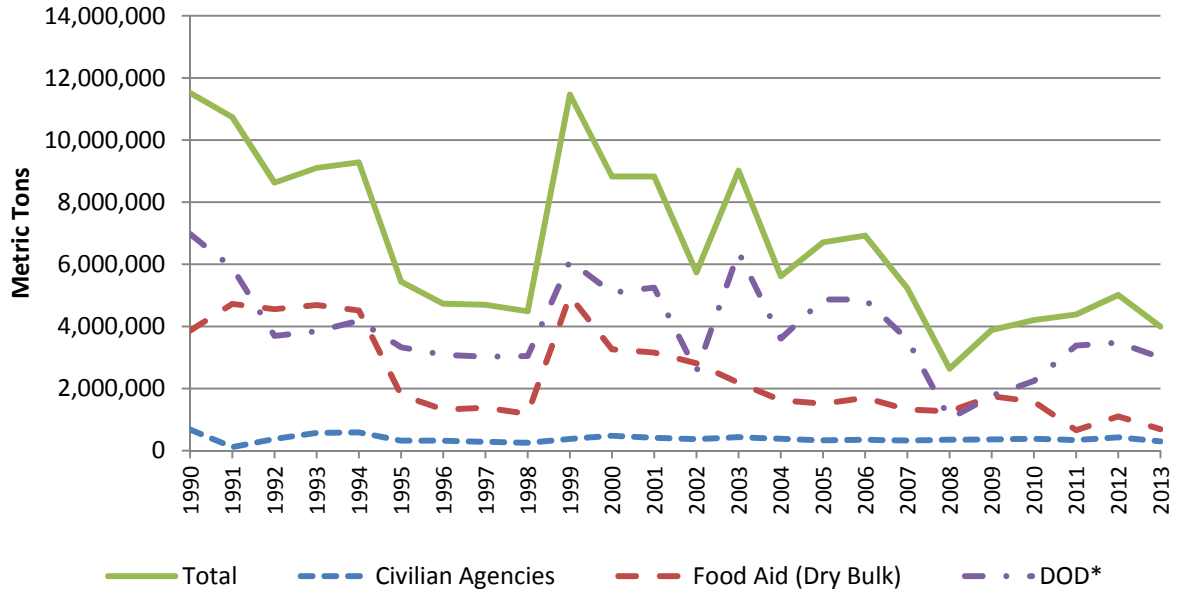
** P.L. 112 -141, which reduced the cargo preference share of food aid tonnage shipped by ocean from 75 percent enacted with the Food Security Act of 1985, P.L. 99-198 to the pre-1985 level of 50 percent was enacted on July 6, 2012. Reimbursements that food aid agencies received for the additional costs of the 1985 increased cargo preference requirement were eliminated in the Bipartisan Budget Act of 2013.

Table 5: Volumes of Cargo Preference Bulk Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Annual Percentage Change)

Year	Food Aid (Dry Bulk)	Civilian Agencies (Liquid Bulk)	DOD* (Liquid Bulk)	Total U.S. Flag
1990	-	-	-	-
1991	22%	-83%	-15%	-7%
1992	-4%	221%	-37%	-20%
1993	3%	53%	4%	6%
1994	-4%	2%	9%	2%
1995	-60%	-46%	-20%	-41%
1996	-26%	1%	-7%	-13%
1997	4%	-11%	-2%	-1%
1998	-14%	-12%	1%	-4%
1999	320%	50%	100%	156%
2000	-35%	26%	-17%	-23%
2001	-3%	-13%	3%	0%
2002	-11%	-10%	-51%	-35%
2003	-22%	17%	151%	57%
2004	-26%	-12%	-44%	-38%
2005	-7%	-14%	35%	19%
2006	13%	7%	0%	3%
2007	-22%	-8%	-26%	-24%
2008	-5%	8%	-71%	-50%
2009	38%	4%	73%	47%
2010	-10%	5%	27%	8%
2011	-58%	-11%	51%	4%
2012	67%	25%	3%	14%
2013 (sequester)	-37%	-30%	-14%	-20%

* For consistency with historical and forecast data, DOD figures may include liquid bulk cargo carried on foreign-flag ships.

Figure 2: Trends in Dry and Liquid Bulk Preference Cargo Carried on U.S.-Flag Vessels



* For consistency with historical and forecast data, DOD figures include liquid bulk cargo carried on foreign-flag ships. Historically, this averages about 10 percent of the total cargo.

It is important to note that bulk cargoes tend to move under charter contracts in large lots to single locations, often on vessels that are on average larger than liner-type vessels. Liner-type vessels, on the other hand, move smaller quantities of cargo usually on fixed routes and regular schedules, although the cargo is usually of higher value than bulk cargo per ton and commands higher shipping rates. As the data herein show, a given tonnage of bulk cargo will support work for a smaller number of bulk vessels than will a given tonnage of non-bulk dry cargo moved on liner-type vessels.

Implications of Cargo Preference Tonnage Trends: Throughout the 2000s, the trends in packaged food aid and military cargoes tended to offset each other, contributing to relative stability in non-bulk dry cargo volumes for much of the decade, although off from peaks of the prior decade. Beginning after 2010, however, these two types of preference cargo began to fall simultaneously due to several factors, contributing to a drop in available preference cargoes, and as will be shown in the next section.[26]

DOD forecasts of reductions in U.S. Armed Forces, particularly overseas, and the winding down of two major wars overseas suggest that military cargoes are likely to return to the levels of the period from 1997-2002. Forecasting food aid volumes – and the mix of non-bulk (packaged) and

[26] Military cargoes are the most important preference cargoes because they are typically carried on liner-service vessels, most of which have high military utility, and the majority of which are enrolled in the MSP program. Bulk cargoes are carried on ships that typically have no utility to the military. Bulk vessels also carry packaged food aid cargoes; these cargoes are a lucrative but de minimis percentage of total tonnage in a given year.

bulk food aid is particularly difficult given that the composition, destination, and costs of food, transportation and distribution vary substantially from year to year. Forecasts of cargo preference volumes are shown in Tables 6 and 7. For civilian and food aid cargoes, the forecast level is assumed to be a straight-line of the 2013 sequestration level, which is the lowest combined level, including non-bulk and bulk cargoes, for these agencies over the period reviewed. DOD liquid bulk level is also forecasted to be straight-lined at the 2013 level.

Table 6: Forecasted Volumes of Non-Bulk Dry Preference Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons)

Year	Food Aid (Packaged)*	Pct.	Civilian Agencies	Pct.	DOD	Pct.	Total	Pct.
2014	379,000	24%	200,000	13%	1,011,000	64%	1,590,000	100%
2015	379,000	23%	200,000	12%	1,080,000	65%	1,659,000	100%
2016	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2017	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2018	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2019	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2020	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2021	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2022	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
2023	379,000	24%	200,000	13%	975,000	63%	1,554,000	100%
* Note: historically, about 10 percent of packaged cargoes are carried on dry bulk ships.								

Table 7: Forecasted Volumes of Cargo Preference Bulk Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons)

Year	Food Aid (Dry Bulk)*	Pct.	Civilian Agencies (Liquid)	Pct.	DOD (Liquid)	Pct.	Total	Pct.
2014	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2015	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2016	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2017	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2018	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2019	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2020	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2021	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2022	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
2023	691,000	17%	300,000	8%	3,000,000	75%	3,991,000	100%
* Note: historically, about 10 percent of bulk cargoes are carried on liner ships.								

The DOD provided the outlook for military cargoes.[27] Their assessment is that "the programmed organic strategic sealift fleet, when fully mobilized, coupled with commercial sealift capability resident in VISA [28] has sufficient capacity to meet the most challenging aspects of the 2012 National Defense Strategy." DOD further determined that "the Departments of Defense and Transportation have sufficient agreements in place to maintain access to needed capabilities."[29] DOD forecasts for commercial sealift are based on expected levels of support to U.S. Armed Forces overseas. The forecast assumes:

- U.S. troop level in Afghanistan is reduced to 10,000 by January 2015 and then remains stable through 2020;
- U.S. Army troop level in the European Command is reduced by 10,000 by FY 2015; and
- Military services will seek to continue reducing total expected Second Destination Transportation costs.

Overall, the outlook provided by DOD indicates that the requirement for military sealift services will remain relatively steady between 2013 and 2016, while ocean liner workload (engaged in the movement of non-bulk dry cargo) is expected to be reduced by 27 percent between 2013 and 2016. Demand for the movement of privately owned vehicles of military personnel is expected to fall by 5 percent. DOD indicates that, "Reduced cargo volumes may result in continued decline of the U.S.-flag fleet and the associated mariners required to crew organic fleets designed to meet national defense needs."[30]

Forecasting food aid for USAID is particularly difficult given that, in addition to appropriations levels, food aid is highly dependent on when and where emergencies are occurring, the composition of food needed, the price of the required commodities, and the costs of transportation, delivery and distribution. The non-emergency programs, including USDA programs, are subject to similar constraints, particularly changes in the food required, its cost and the costs for transport, delivery and distribution.

MARAD did not request agency-level forecasts for the various programs grouped under civilian cargo. In general, these cargoes have held at relatively low levels for the last decade. MARAD assumes that civilian dry cargo and bulk petroleum cargoes will hold at levels of 200,000 metric tons and 300,000 metric tons per year, respectively, over the next decade, and used the assumption of 200,000 metric tons for the forecast.

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[27] Office of the Secretary of Defense-approved, "3-25 USTRANSCOM PROJECTIONS FOR MARAD," PowerPoint presentation (Unclassified), March 25, 2014.

[28] VISA is the Voluntary Intermodal Sealift Agreement between the Departments of Defense and Transportation through which U.S. commercial shipping companies cooperate with the Department of Defense to meet military sealift requirements during contingency operations. VISA integrates the capabilities of the U.S.-flag fleet to augment the DOD organic fleet of ships used to meet contingencies. VISA capacity focuses on resupply and ammunition needed by combat forces.

[29] Information provided to MARAD by USTRANSCOM, PowerPoint presentation on projected workload, dated 3-25-2014.

[30] Office of the Secretary of Defense-approved, "3-25 USTRANSCOM PROJECTIONS FOR MARAD," PowerPoint presentation (Unclassified), March 25, 2014.

OTHER GOVERNMENT SUPPORT TO THE U.S.-FLAG FLEET

Various programs in addition to cargo preference have supported the U.S.-flag fleet. These programs consist of the longstanding Jones Act, which established existing U.S. maritime cabotage policy, and operating cost assistance to qualifying U.S.-flag vessels engaged in the international trades.

Jones Act

The Jones Act is the popular name for Section 27 of the Merchant Marine Act of 1920, as amended, which requires vessels that serve U.S. domestic trade meet all of the following criteria:

- Owned by U.S. companies that are controlled by U.S. citizens with at least 75 percent U.S. ownership;[31]
- Operate with crews that are all U.S. citizens in licensed positions and at least 75 percent U.S. citizens in unlicensed positions;[32]
- Built (or rebuilt) in the United States;[33] and
- Registered in the United States.[34]

The Jones Act applies to all coastwise and non-contiguous U.S. domestic trades and employs the majority of U.S. merchant mariners.[35] This includes ocean-going shipments on U.S.-flag vessels to and from Hawaii, Alaska, Guam and Puerto Rico, on which U.S. merchant mariners possessing a U.S. Coast Guard Merchant Mariner Credential with unlimited ocean and tonnage endorsement operate. The Jones Act is important in sustaining the U.S.-flag water transportation industry and the U.S. shipyard industry. Of the more than 40,000 vessels of all types under the U.S.-flag as of the end of 2012 (including a very large number of tugs and barges),[36] all but 106 of these vessels were Jones Act-eligible, relying solely or primarily on the carriage U.S. domestic cargoes or (in some instances) passengers.[37] The great majority of Jones Act-eligible vessels serve exclusively in the domestic trades, although some oceangoing vessels also participate in international trades and will, on occasion, carry preference cargo. The trend in

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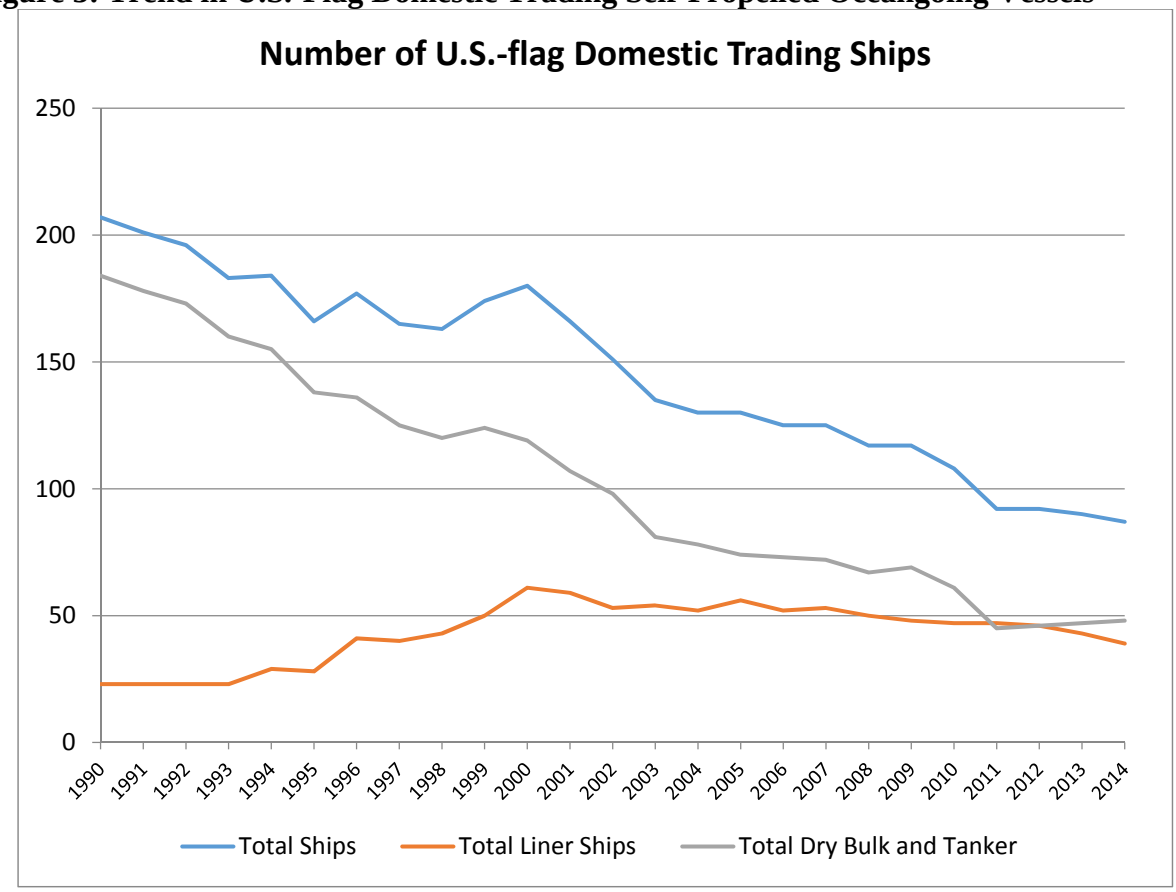
[31] 46 U.S.C. § 55102; 46 U.S.C. § 50501.
[32] 46 U.S.C. § 8103.
[33] 46 U.S.C. § 12112.
[34] 46 U.S.C. § 55102(b)(2)..
[35] There are over 40,000 vessels that operate on the inland and coastal waterways of the U.S. subject to the requirements of the Jones Act, the vast majority of which are non-self-propelled barges. These vessels serve a different market than the 81(end of 2014) self-propelled vessels in the U.S.-flag self- propelled international trading fleet. Source : U.S. Army Corps of Engineers, Waterborne Transportation Lines of the U.S., Calendar Year 2012 p 3, http://www.navigationdatacenter.us/veslchar/pdf/wtlusvl1_12.pdf
[36] U.S. Army Corps of Engineers, Waterborne Transportation Lines of the U.S., Calendar Year 2012 p 3, http://www.navigationdatacenter.us/veslchar/pdf/wtlusvl1_12.pdf
[37] The Jones Act cabotage provisions apply to cargo vessels. Cabotage law for the carriage of passengers stems from the Passenger Vessel Services Act of 1886, 46 U.S.C. § 55103.

U.S.-Flag ocean-going domestic trading vessels is shown in Figure 3, details are included in Appendix 1.

Figure 3: Trend in U.S.-Flag Domestic Trading Self-Propelled Oceangoing Vessels



Jones Act-eligible vessels do not rely on preference cargoes or MSP stipends for their revenues. Hence, the fleet of interest in this report of the impact of cargo preference is the U.S.-flag international trading fleet, which consists primarily of large, self-propelled ships owned by private companies and crewed with U.S. merchant mariners.

Since the Merchant Marine Act of 1936, two cash payment programs have been used in combination with the indirect assistance provided by cargo preference law to directly assist U.S.-flag international trading vessels in covering the difference between U.S. vessel operating costs and those of foreign-flag vessels. These two direct-assistance programs are ODS and MSP, which effectively replaced the ODS program.

Operating Differential Subsidy Program

U.S.-flag vessels that are not eligible for Jones Act trading must compete with vessels operating under foreign registries (foreign-flag vessels). Foreign-flag vessels typically have significantly lower operating costs than U.S.-flag ships. The Merchant Marine Act of 1936, as amended,

established the ODS program which provided subsidies (intended to equal the difference between U.S.-flag and foreign-flag vessel operating costs) through 20 year contracts to U.S.-flag vessels participating in international trade.[38] This program was phased out beginning in 1981, when a moratorium was placed on the award of new ODS contracts.[39] On September 30, 1980, ODS contracts covered 165 subsidized vessels in operation.[40] In fiscal year (FY) 1993, MARAD provided 75 vessels with a total of $215.5 million in ODS payments.[41] However, by 1998 this number had fallen to seven ships under contract. The final ODS contracts expired at the end of FY 2001 (with the expiration of the last 20-year contract granted in 1981).[42]

Maritime Security Program

The MSP was authorized by the Maritime Security Act of 1996 to provide stipends for the militarily-useful vessels required for sustainment sealift.[43] Specifically, MSP vessels are selected in consultation with DOD's U.S. Transportation Command (USTRANSCOM) for their suitability for military cargo requirements and cannot be more than 15 years old when entering the program. The MSP was originally established as a 10 year program for up to 47 vessels in U.S. registry. It was reauthorized in 2003 for 10 more years, at which time the number of ships in the MSP fleet was increased from 47 to 60.[44] The National Defense Reauthorization Act for Fiscal Year 2013 extended the MSP program to 2025.[45] Unlike the ODS program, which was intended to cover the full difference between U.S.-flag and foreign-flag operating costs (within certain constraints), the MSP was established as a fixed annual stipend per ship to cover a significant portion of this difference. The stipend amount has periodically increased over the life of the MSP program. When the MSP began in 1996, payments were authorized at $2.1 million per ship. Currently, the stipend is $3.1 million per vessel. MARAD has surveyed several vessel owners who volunteered estimates suggesting that the average cost differential between U.S-flag and foreign-flag vessels was about $4.6 million per vessel per year in 2010.[46] In addition, whereas the ODS program provided subsidies to dry bulk ships and tankers in the international trade (authorized by the Merchant Marine Act of 1970)[47], no dry bulk vessels have qualified or

[38] 46 U.S.C. §§ 1171-1185a.
[39] GAO Ibid, p. 13. Vessels receiving ODS were not allowed to engage in Jones Act trade and their subsidies were reduced if they moved cargo between U.S. ports as part of a voyage involving foreign ports.
[40] Comptroller General of the United States, Maritime Subsidy Requirements Hinder U.S.-Flag Operators' Competitive Position , CED-82-2, November 30, 1981 p. 4, http://archive.gao.gov/f0102/116935.pdf.
[41] GAO Ibid, p. 13.
[42] Maritime Administration Annual Reports, 1994-2001 (unavailable online).
[43] The Maritime Security Act of 1996 (P.L. 104–239) was signed into law on October 8, 1996. It authorized annual stipends for up to 47 modern U.S.-flag merchant ships.
[44] On November 24, 2003, the President signed the National Defense Authorization Act for Fiscal Year 2004, which contained the Maritime Security Act of 2003 (MSA 2003) reauthorizing the MSP for FY 2006 through FY 2015. MSA 2003 authorized stipends for up to 60 ships.
[45] National Defense Authorization Act for Fiscal Year 2013 (H.R. 4310), Title XXXV, Sec. 3508.
[46] Maritime Administration, Comparison of U.S. and Foreign-Flag Operating Costs, September 2011, pp. 10-11, http://www.marad.dot.gov/documents/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf. This report contains unaudited data provided by participating carriers.
[47] Comptroller General of the United States, Maritime Subsidy Requirements Hinder U.S.-Flag Operators' Competitive Position , CED-82-2, November 30, 1981 p. 4, http://archive.gao.gov/f0102/116935.pdf

been selected for the MSP program and only three tankers (and currently only two) have received MSP stipends.[48] A summary of the number of vessels under ODS or MSP contracts since 1990 is shown in Table 8.

[48] Maritime Administration, Maritime Security Program Fleet (MSP) website, February 1, 2014, http://www.marad.dot.gov/documents/MSP_Fleet_2-1-14.pdf.

Table 8: Vessels Covered Under ODS or MSP Contracts, By Year as of September 30

Year	Operating Differential Subsidy (ODS)			Maritime Security Program (MSP)		Total Support Contracts	
	Liners	Dry Bulk	Tanker	Liners	Tanker	Liners	Bulk/Tanker
1990	59	10	24	0	0	59	34
1991	58	10	23	0	0	58	33
1992	54	8	23	0	0	54	31
1993	51	8	21	0	0	51	29
1994	47	9	19	0	0	47	28
1995	34	5	22	0	0	34	27
1996	25	5	18	0	0	25	23
1997	22	4	5	47	0	69	9
1998	2	2	5	47	0	49	7
1999	0	2	5	47	0	47	7
2000	0	2	5	47	0	47	7
2001	0	0	0	47	0	47	0
2002	0	0	0	47	0	47	0
2003	0	0	0	47	0	47	0
2004	0	0	0	47	0	47	0
2005[49]	0	0	0	57	3	47	3
2006	0	0	0	57	3	57	3
2007	0	0	0	57	3	57	3
2008	0	0	0	57	3	57	3
2009	0	0	0	57	2	57	2
2010	0	0	0	57	3	57	3
2011	0	0	0	58	2	58	2
2012	0	0	0	58	2	58	2
2013	0	0	0	58	2	58	2
2014	0	0	0	58	2	58	2
Source: Maritime Administration, Annual Reports, 1990-2012.							

These discrepancies between the MSP and ODS programs are significant from the standpoint of the support offered to U.S.-flag ships. Of the 60 vessels currently enrolled in the MSP, two are tank vessels and the rest are containerships, geared containerships, Ro/Ros or heavy lift ships

[49] Reauthorization of the program increased the fleet size from 47 to 60 MSP ships.

(generally classified as non-bulk, liner-type vessels).[50] The two non-liner vessels in the MSP in 2014 compare to 34 tanker and dry-bulk ships in the ODS program as of 1990,[51] consistent with the MSP requirement for vessels to be militarily useful.

Continued Dependence on Preference Cargo

Although the intention of the ODS program was to establish cost parity with foreign-flag competitors, GAO assumed in its 1994 study that "… ODS payments alone, in the absence of preference cargo, are generally not sufficient to induce a carrier to remain U.S.-flagged."[52] GAO did not describe the basis of this assumption, but various requirements of the ODS program appear to have made it difficult to attain true cost parity with foreign-flag competition.

The MSP, on the other hand, pays a fixed stipend that does not cover the full difference between U.S.-flag and foreign-flag costs, in part to incentivize operators to reduce costs as much as possible. MSP vessels must carry commercial cargoes, including U.S. Government impelled cargoes, for at least 320 days per year to receive the full MSP payment, and this requirement is mainly met by carrying DOD government-impelled cargoes. MARAD's 2011 report states that the MSP payment covers only two-thirds of the estimated average $12,600 per day in higher U.S.-flag vessel operating costs relative to foreign-flag vessels as of 2010.[53] The higher freight rates that DOD and civilian agencies pay to move preference cargoes can be used by U.S.-flag carriers to reduce their freight rates to competitive levels for commercial cargoes[54]. The higher revenues received from agencies to move their preference cargoes are the main source of revenues and U.S. Government assistance for the 20+ international-trading vessels under the U.S.-flag that do not receive MSP stipends (more than 20 liner-type vessels, three dry bulk ships and three international trading tankers under U.S. flag in 2013).

Recent industry reports support the view that the uncovered gap between the MSP stipend and the higher cost of U.S.-flag vessel operations would make U.S.-flag vessel operations unsustainable without the availability of preference cargoes. In coordination with the 2011 MARAD report, MARAD commissioned a report to provide information about the factors that significantly impact the ability of U.S.-flag vessels to compete effectively in international

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[50] Maritime Administration, "Maritime Security Program Fleet (MSP), February 1, 2014," http://www.marad.dot.gov/documents/MSP_Fleet_2-1-14.pdf.

[51] Maritime Administration, Maritime Administration 1990 Annual Report, May 1994.

[52] U.S. Government Accountability Office (then U.S. General Accounting Office). MARITIME INDUSTRY: Cargo Preference Laws—Estimated Costs and Effects. GAO/RCED-95-34. November 1994, p. 26, http://www.gao.gov/assets/160/154784.pdf.

[53] Maritime Administration, Comparison of U.S. And Foreign-Flag Operating Costs, September 2011, pp. 10-11, http://www.marad.dot.gov/documents/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf. On average the gap not covered by the MSP for each vessel in 2010 was approximately $4,100 per day. Note that the uncovered gap for 2009 would have been larger.

[54] Commercial cargoes in the context of this report are those cargoes traded internationally that are not subject to cargo preference laws and agreements and thus are not required to be carried on U.S.-flag ships.

transportation markets.[55] MARAD selected 13 carriers to participate in the industry consultation process, representing 99 percent of the U.S.-flag oceangoing international trade vessels in the U.S.-flag fleet.[56] During the industry consultations, the carriers indicated that there are two critical factors that affect their decision to register vessels under the U.S.-flag fleet: the availability of preference cargo, and the operating cost differential between U.S.-flag vessels and foreign-flag vessels.[57] The carriers specifically noted the following points:

- The operating cost differential between U.S.-flag vessels and foreign-flag vessels has increased in recent years, further reducing the capacity of the U.S.-flag fleet to compete with foreign-flag vessels for commercial cargo and increasing the importance of U.S. preference cargo which is shipped at freight rates that, while competitive among U.S.-flag carriers, are higher than those in the unrestricted international trades.[58]
- In the absence of robust preference cargo volumes at freight rates that cover the higher commercial cost of operating under U.S. registry, the financial support provided by MSP is insufficient to continue operating under the U.S. flag.[59]

Military Sealift Command Long-Term Charters: USTRANSCOM's Military Sealift Command (MSC) has chartered significant number of U.S.-flag privately-owned vessels, particularly in the 1990s. Through charters, the Government contracts and pays for the use of the entire ship. Ships can be chartered for one voyage or for a defined length of time. DOD Directive 4500.09E, "Transportation and Traffic Management," specifies that if a ship is chartered for a period greater than 90 days, it is a DOD-controlled asset.[60] Chartered vessels do not receive subsidies. However, these vessels remain under private ownership and employ U.S. merchant mariners under contract.

Table 9 shows the numbers of MSC long-term contracts (6 months or more) over the period from 1990 to 2013. Numerous U.S.-flag vessels have operated under these contracts, although the number of vessels under contract has consistently declined over the analysis period. In 2013, nine self-propelled commercial vessels (excluding several offshore vessels and a tug-barge) were under contract.

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[55] PwC, Study of the Impediments to U.S.-Flag Registry: Final Report, September 20, 2011, attached to http://www.marad.dot.gov/documents/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf. Note that the PwC report is Appendix C of MARAD's Comparison of U.S. And Foreign-Flag Operating Costs report and provides a breakout of the additional costs for U.S.-flag vessels.
[56] PwC, ibid., p. 8 of 71.
[57] PwC, ibid., p. 8 of 71.
[58] PwC, ibid., p. 9 of 71. Note that the freight rates offered for preference cargo are commercially competitive among U.S.-flag carriers, as is required by law, but that such rates are generally higher than would be offered by foreign-flag carriers.
[59] PwC, ibid., p. 9 of 71.
[60] Inspector General of the U.S. Department of Defense, "Ship Utilization in Support of the Global War on Terror, Report No. D-2009-093, July 15, 2009, p. 2, http://www.dodig.mil/audit/reports/fy09/09-093.pdf.

Table 9: MSC Long-term Charters of U.S.-Flag Privately Owned Self-Propelled Vessels

Year	Intermodal	General Cargo/Other	Tankers	Dry Bulk	Total
1990	21	9	24	0	54
1991	24	6	20	0	50
1992	26	7	16	0	49
1993	25	7	15	1	48
1994	27	5	10	0	42
1995	22	7	9	0	38
1996	22	7	9	0	38
1997	18	10	8	0	36
1998	16	11	8	1	36
1999 (*)	24	11	6	0	41
2000 (*)	16	9	4	0	37
2001	18	3	0	0	21
2002	21	1	0	0	21
2003	18	4	2	0	24
2004	18	4	2	0	24
2005	18	3	1	0	22
2006	18	4	1	0	23
2007	17	3	1	0	21
2008	14	4	1	0	19
2009	11	4	1	0	16
2010	13	3	2	0	18
2011	4	2	3	0	9
2012	4	2	3	0	9
2013 (sequester)	4	2	3	0	9

*Estimated from graphic in Military Sealift Command Annual Reports. Sources: Maritime Administration Annual Reports, 1990-1998; Military Sealift Command Annual Reports, 1999 to 2012 (see http://www.msc.navy.mil/annualreport/archive.htm). Excludes government-owned vessels and non-self-propelled vessels, as well as vessels not engaged in the carriage of cargo (e.g., Special Mission vessels). Some Jones Act eligible vessels were chartered by MSC.

DOD expects that MSC will charter three vessels for dry cargo movements after 2014, based on its projection of voyage charter days.[61] Accordingly, the six U.S.-flag privately owned intermodal and general cargo/other vessels that are chartered for dry cargo movements or prepositioning may be reduced to three vessels. DOD expects that chartering of tanker vessels for movement of petroleum cargoes will hold constant at current levels.

MSC is required to decide whether to use chartered versus commercially-available vessels depending on which is the most cost-effective. [62, 63] Therefore, it is expected that MSC

[61] Office of the Secretary of Defense, "3-25 USTRANSCOM PROJECTIONS FOR MARAD," PowerPoint presentation (Unclassified), March 25, 2014.

[62] MSC reports cargoes carried by vessels under its charter as 1904 Cargo Preference Act cargo. Military Sealift Command, MSC 2012 in Review, Appendix, Sealift Dry Cargo: 1904 Cargo Preference Act, http://www.msc.navy.mil/annualreport/2012/appendix.htm

chartering activity, is to a large extent, a factor of the volume of preference cargo to be carried, and that as the volumes of preference cargoes diminish, so will chartering activities. As such, the two factors – volume of preference cargo and MSC chartered vessels – are largely redundant as a measure of vessel employment. In the analysis to follow, MARAD focuses on the volume of preference cargo without regard to MSC chartering activity.

In summary, preference cargoes are essential to the economic viability of U.S.-flag shipping in the international trades. Should such cargoes continue to decline in volume as they have in recent years, it is a near certainty that vessels will leave the U.S.-flag fleet and reflag to operate more profitably. Such vessel losses would continue a long-standing trend. At some level, less cargo could erode the ability to sustain the full 60-vessel authorized level for the MSP.

U.S.-FLAG INTERNATIONAL TRADING FLEET OF SELF-PROPELLED VESSELS

The U.S.-flag international trading fleet, as defined in this report, consists of vessels that are not eligible for participation in the Jones Act domestic trades, usually because they have been built in foreign shipyards. This fleet of 81 vessels (as of January 22, 2015) consisted of 45 containerships, 19 Ro/Ro vessels, nine general cargo ships, five tanker vessels, and three dry bulk ships.[64]

The 1954 Act, as amended, recognizes three classes of vessels: liner, dry bulk and tanker. For the purposes of this report, liner vessels typically include ships that carry cargoes in units of containers, trailers, or discrete packages or units usually on regular shipping schedules and established trade lanes. As such, the containerships, Ro/Ros and general cargo vessels are classified as liner vessels in this report, collectively representing 73 of the 81 U.S.-flag vessels operating in international trades.[65] While these vessels are all classified as liner-service types in this report, the cargoes carried by these different types of vessels are often not interchangeable or can only be interchanged with a loss of efficiency. Similarly, across the liner-service type and bulk-service type vessels, cargoes are often specialized and not interchangeable.

In any given year, some number of Jones Act-eligible domestic trading vessels will also carry preference cargoes on routes to foreign destinations. The vessels are not, however, included in this analysis, as their participation in the cargo preference program is usually sporadic and their principal economic support is derived from Jones Act domestic trade.

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[63] Inspector General of the U.S. Department of Defense, "Ship Utilization in Support of the Global War on Terror, Report No. D-2009-093, July 15, 2009, p. 11, http://www.dodig.mil/audit/reports/fy09/09-093.pdf.

[64] Maritime Administration, 2000-2014 U.S.-Flag Privately-Owned Fleet Summary (Released 01/22/2015), http://www.marad.dot.gov/library_landing_page/data_and_statistics/Data_and_Statistics.htm. See workbook tab "Non-Jones Act Eligible."

[65] "Liner service" means a service that operates within a schedule and has a fixed port rotation with published dates of calls at the advertised ports. However, in practice, the term "liner" is often applied to the vessels that typically offer liner services, which includes the vessel types defined above.

The number of self-propelled oceangoing vessels in the U.S.-flag international trading fleet is shown in Table 10. Since the late 1990s, the number of containerships and Ro/Ros has remained relatively constant and the average size of the vessels has continued to increase (Table 11), so that the average deadweight tonnage overall is roughly 10-15 percent higher than in the late 1990s. The containership and Ro/Ro fleets have been particularly well suited to the movement of military preference cargoes. They are also able to carry packaged and, where appropriate, containerized food aid cargoes.

Table 10: Number of U.S.-Flag International Trade Vessels since 1990

Year	Total Ships	Liner Vessels				Dry Bulk Carrier	Tanker
		Container ships	RO/RO	General Cargo	Total Liner Ships		
1990	199	80	24	47	151	12	36
1991	188	80	24	40	144	12	32
1992	188	80	26	40	146	12	30
1993	176	77	22	38	137	12	27
1994	166	74	21	32	127	13	26
1995	151	69	21	25	115	12	24
1996	126	55	21	23	99	9	18
1997	121	58	19	19	96	9	16
1998	118	61	18	19	98	9	11
1999	110	53	21	20	94	7	9
2000	92	50	20	9	79	6	7
2001	95	52	21	8	81	8	6
2002	95	54	21	9	84	8	3
2003	96	53	22	11	86	8	2
2004	101	59	22	9	90	9	2
2005	100	50	26	12	88	7	5
2006	96	46	25	12	83	7	6
2007	100	53	25	10	88	7	5
2008	100	52	26	10	88	7	5
2009	104	57	24	11	92	7	5
2010	106	55	25	13	93	7	6
2011	106	56	23	15	94	5	7
2012	95	50	22	15	87	3	5
2013	89	46	21	14	81	3	5
2014	81	45	19	9	73	3	5

Dry bulk vessels consist of three self-propelled vessels as of 2014. In addition, some multipurpose general cargo ships with both bulk and container capacity and tug-barge vessels remain in service as well carrying bulk food aid.

DOD liquid bulk cargoes have varied significantly over time but the number of U.S.-flag tankers has been in the current range since the late 1990s.[66] Of the five remaining self-propelled international trading tanker vessels, two are MSP-contract tankers and three tanker vessels are under long-term MSC charter.[67] These cargoes offer relatively minor employment.

In addition to the dry and liquid bulk ships, general cargo vessels fell off sharply in the 1990s. This could be due to factors such as the ending of ODS contracts (only 7 general cargo ships were among the 47 MSP ships in 2000) or changes in the nature of shipping such as the trend away from general cargo vessels and towards containerships and Ro/Ros. These vessels have also have been adversely impacted by declines in civilian and military preference cargoes in the latter part of the 1990s (see Table 1 and Figure 1). Thereafter, general cargo ship numbers stabilized, with some higher usage after 2009 possibly related to military cargoes for the Iraq and Afghanistan conflicts and/or a growth in civilian project cargoes carried under cargo preference.

The containership and Ro/Ro fleets both declined through the 1990s, but by less than was the case with other vessel types. Generally, factors such as the phasing out of ODS contracts in the first half of the 1990s contributed to the decline. An offsetting factor was the implementation of the MSP beginning in 1997, which initially selected large numbers of containerships and subsequently (particularly after 1998) substantial numbers of Ro/Ros. These intermodal ships were also particularly well suited to the movement of military preference cargoes in the latter part of the 1990s and into the next decade. They are also able to carry packaged and containerized food aid cargoes. With the exception of a few years after 2001, containership numbers remained around 50 vessels with increasing average deadweight tonnage compared to the 1990s, while the Ro/Ro fleet and its average deadweight tonnage is about at the same level that it was in the early 1990s. The number of containerships in the fleet reached their lowest level (45 vessels) in 2014.

Vessel Size Trends

The world commercial fleet has trended toward ever larger vessel sizes over the last 60 years, realizing the efficiencies of large vessel size (i.e., economies of scale); new vessel designs; improved and faster cargo handling capabilities in ports; deeper channels; and the benefits of

[66] Regulation of petroleum tankers may have been a factor in the decline of the U.S.-flag international trading fleet. The Oil Pollution Act of 1990 (P.L. 101-380), passed by Congress in August 1990, and the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78 mandated worldwide transition to double-hull vessels or their equivalents and required the phase out of single-hull tankers from the petroleum trades. The combined U.S. and international actions clearly put additional pressure on tanker owners to retire older tonnage in the international trade. Some of these ships entered the international dry bulk trades to carry preference and other cargoes but did not stay long because of their age and cargo availability. Some accounts suggest that the removal of so many vessels from the fleet following the Valdez oil spill was to reduce tanker accident liability.

[67] U.S. Navy, Military Sealift Command, Sealift, http://www.msc.navy.mil/PM5/.

improved engine and navigational technologies. As vessel sizes increase, it takes fewer vessels to carry a given quantity of cargo, although world commercial cargo volumes have increased dramatically, employing more vessels (albeit larger ones) overall.

Table 11 shows the average vessel size in the U.S.-flag international trading fleet since 1990. Containerships, which constitute over half of the U.S.-flag fleet, have increased in size consistently from 1990 to 2014, beginning at around 34,000 dwt and reaching 57,000 deadweight tons (dwt) by the end of 2014. Much of this increase reflects the size trends of containerships in world markets. The containership capacity in the U.S.-flag fleet is largely provided by the U.S. subsidiaries of Maersk Line (Maersk Line Ltd) and Neptune Orient Lines (APL Ltd) in their service in the MSP. These U.S.-flag vessels serve as integral components of the parent companies' worldwide commercial services which, due to extreme competition in world container shipping markets, have brought on the larger ships to lower the per unit costs of carrying containers.

Ro/Ro vessels have remained relatively constant in size, reflecting the much more limited volumes of the specialty and wheeled cargoes in world markets that are most efficiently carried by these vessels. General cargo ship average sizes in the U.S.-flag fleet have actually fallen since 1990, as larger but older partial containerships have been replaced by multipurpose and other non-container vessels best suited to the needs of military and project cargoes. In total, for liner vessels of all types, size trends increased gradually over the period due to the predominance of containerships in the fleet mix.

The average size trend in dry bulk ships has been slightly upwards from 47,000 dwt in 1990 to 51,000 dwt, although this average is based on only three vessels as of 2012 and 2014. Tanker vessel average size has actually fallen since 1990, reflecting the complete disappearance of U.S.-flag crude carriers in international trades possibly due to the end of the ODS contracts, the fact that U.S. Government-impelled movements of crude are minimal except for occasional movements of foreign crude oil to the Strategic Petroleum Reserve, and concerns about tanker liability in the event of accidents following the *Exxon Valdez* incident which resulted in the enactment of the Oil Pollution Act of 1990.

MARAD does not expect that the increasing size of containerships would have had an adverse impact on the number of containerships in the U.S.-flag international trading fleet, unless the cargoes being carried by these vessels were predominantly preference cargoes. The numbers of purpose-built containerships in the world fleet (as opposed to the U.S.-flag international trading fleet) has risen from 1,358 vessels at the end of 1990, to 2,607 vessels in 2000, to over 5,126 vessels as of the end of 2013, even as average containership size increased from 1,301 twenty-foot equivalent units (TEU) in 1990, to 1,685 TEU in 2000, and 3,415 TEU as of 2013.[68] Driven by growth in world trade, overall world fleet size as measured in TEU capacity increased from 1,766,700 TEU as of the end of 1990, to 4,393,900 TEU in 2000, to 17,143,700 TEU as of

[68] Clarkson Research Service, First Quarter 2014, p. 114. Capacity is not tracked in deadweight tonnage.

the end of 2013—almost a ten-fold increase.[69] Accordingly, increasing vessel size does not, of itself, lead to falling vessel numbers during times of growing trade.

The U.S.-flag international-trading containership fleet, by comparison, was at 74 vessels averaging 33,800 dwt each (2,572 TEU per vessel) as of the end of 1990, 47 vessels averaging 33,800 dwt each (3,351 TEU per vessel) as of the end of 2000, and 45 vessels averaging 44,800 dwt (4,275 TEU per vessel) as of the end of 2013.[70] TEU capacity has, however, escalated rapidly in the last two years, increasing from an average vessel size of 3,860 TEU at the end of 2011. Containerized preference cargoes typically have not, however, moved in volumes that would have taxed the capacity of the individual U.S.-flag containerships deployed in liner services over the last few decades. Information from one industry source indicates that approximately one third of its U.S-flag vessel cargo was preference cargo;however no information could be obtained to indicate what share of vessel TEU capacity was taken by this cargo. MARAD notes that Lloyd's List reports that East Coast North America to North European containership utilization has been approximately 75 percent whereas East Coast North America to Mediterranean utilization has been slightly less over the last two years. This information suggests that, if one-third of outbound cargo was preference cargo, but only 75 percent of the vessel capacity was utilized, then only 25 percent of an average vessel's capacity was filled by preference cargo (that is, 75 percent of capacity occupied by all cargo multiplied by 33 percent of all cargo consisting of preference cargo results in 25 percent of capacity occupied by preference cargo).

Thus, while the availability of preference cargo is almost certainly critical to continued operations of many U.S.-flag containerships, containers of preference cargo would occupy, on average, less than half of the capacity of containerships operating over the analysis period and would likely not, of themselves, justify a push for larger vessels. At the same time, the largest U.S.-flag containership operator, which has also been the most aggressive in increasing TEU capacity, has not reduced the number of vessels it operates under U.S.-flag. It is instead likely that the trend to larger containership sizes is driven by the particular size efficiencies of these ships (relative to other liner-type vessels) and the need to become more competitive in international commercial markets so as to acquire more non-preference cargoes.

It is also important to note that larger U.S.-flag ships do not need to carry substantially more preference cargo than do smaller U.S.-flag ships to make up for their higher operating costs relative to foreign-flag vessels. Over the range of vessel sizes discussed in this report, crew size and cost are approximately the same per vessel (approximately 20 crew members per vessel) whether the ship is 25,000 dwt or 50,000 dwt. Crew costs constitute the majority of vessel operating costs (other than fuel), as well as the largest operating cost differential relative to the foreign-flag fleet which also include insurance, stores and lubricants, maintenance and repair, general and administrative costs. Larger containerships, because they are often newer than smaller ones, may also have maintenance costs comparable to the smaller and older vessels.

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[69] Ibid, Clarkson Research Service, p. 114.
[70] MARAD data records do not report vessel TEU capacity prior to 2000.

Thus, a trend to larger ships would not generally create a need or demand for more preference cargo per vessel.

Absolute declines in preference cargoes and/or higher profitability in foreign-flag commercial trade are more likely to be a cause of vessels not enrolled in MSP leaving the U.S. flag. Ro/Ro vessels, which are perhaps the vessels most dependent on preference cargo (due to more limited commercial markets) have declined in number over the last 10 years even as average vessel size has remained relatively constant, whereas general cargo ships have risen in number since the late 1990s, even as average vessels sizes have been stable since then.

Table 11: Average Vessel Size in Deadweight Tons of U.S.-Flag International Trade Vessels since 1990 (DWT)

Year	All Vessels	Liner Vessels				Dry Bulk Carriers	Tanker
		Container ships	General Cargo	Roll-On/Roll-Off	All Liner		
1990	41,723	33,703	20,091	19,232	27,166	47,268	100,933
1991	41,490	33,703	21,346	19,232	27,859	47,268	100,662
1992	40,380	33,703	22,416	19,266	28,040	47,268	97,683
1993	36,549	34,335	23,166	19,578	28,867	47,268	70,763
1994	37,160	34,932	24,557	19,248	29,724	50,663	66,727
1995	37,156	34,412	24,837	19,481	29,604	47,268	68,283
1996	37,687	36,066	25,406	19,481	30,072	48,483	74,177
1997	35,599	36,214	27,533	20,584	31,402	48,468	53,539
1998	36,120	39,061	28,897	20,268	33,639	47,253	49,117
1999	35,493	39,876	26,759	19,861	32,614	53,476	51,577
2000	37,339	41,491	25,915	20,179	34,321	56,639	54,856
2001	37,193	41,999	22,922	19,780	34,354	55,129	51,610
2002	36,568	43,506	21,609	19,780	35,229	55,129	24,560
2003	36,564	45,006	18,982	19,785	35,225	55,129	19,890
2004	38,087	45,663	20,533	19,785	36,824	54,761	19,890
2005	36,648	48,081	16,558	20,261	35,563	52,336	33,795
2006	36,376	48,933	16,558	20,067	35,558	52,336	29,079
2007	37,947	49,132	14,979	20,194	37,030	52,336	33,939
2008	37,460	48,727	14,979	19,819	36,351	52,336	36,154
2009	39,061	50,645	14,348	19,611	38,209	52,336	36,154
2010	38,291	50,981	13,340	21,148	37,700	52,336	31,074
2011	37,830	50,359	13,803	20,886	37,314	55,563	32,089
2012	38,240	51,986	14,823	21,084	37,764	51,005	38,862
2013	40,102	55,791	15,352	20,972	39,774	51,005	38,862
2014	42,603	56,879	16,129	20,869	42,482	51,005	39,326

Vessel Age Trends: U.S.-flag vessels have often been assumed to be older, on average, than foreign competitors, possibly contributing to an aging out of older vessels at more rapid rates than would be the case with foreign competitors. MSP requirements in place since 1996, however, generally restricted vessel ages to 15 years or less to enter the program.[71] MSP vessels can also be replaced quickly and with immediate eligibility to carry preference cargoes of all

[71] 46 CFR 296.11 - Vessel requirements, http://www.law.cornell.edu/cfr/text/46/296.11

types.[72] In virtually all cases, MSP vessels are built in foreign shipyards and are available at world prices.

National-flag vessels overall tend to operate for more years than foreign-flag vessels. Older vessels cost more to operate and insure, and the higher freight rates that are possible under the U.S.-flag and allow older vessels to keep operating, particularly for civilian and food aid cargoes.

Vessels in the U.S.-flag international trading fleet which are not in the MSP may also be purchased from abroad. However, before a vessel purchased from abroad can carry food aid and other civilian preference cargoes, it must be under U.S.-flag for three years before it is eligible to move such cargoes.[73] The "three-year wait" provision does not apply to foreign-built U.S.-flag vessels that carry DOD preference cargoes under the 1904 Act or loan-financed civilian cargoes under PR17.[74] This provision was enacted in order to provide protection to vessels of U.S. registry engaged in the bulk trades.[75]

There is some belief that the "three-year wait" provision acts as a deterrent to vessel owners who desire to bring foreign-built vessels into the U.S. registry because (absent participation in MSP or MSC long-term charger) the owners cannot afford to have a vessel sit idle for three years.[76] This could contribute to a decline in the U.S.-flag fleet as vessels age out and are not replaced. In general, however, there has been and continues to be a significant number of foreign-built liner-type vessels coming off MSP contracts or MSC charters that would have already qualified under the three-year wait rule. These vessels have not, however, been picked up by U.S. owners in recent years. Some of these vessels are particularly suited for military use versus commercial, civilian or food aid cargoes, and are often more than 25 years old and less efficient than new vessels when they come off of MSC or other long-term charters. The exception to the use of foreign-built vessels coming off charter is in the case of dry bulk ships, which are not considered militarily-useful under the MSP or MSC programs.

Table 12 shows the average age of U.S.-flag ships in the international trades since 1990, indicating that overall age of this fleet has not been excessive. The exception has been in the case of general cargo ships, which remained valuable for the carriage of military cargoes. The average age of the general cargo fleet declined sharply in the 1990s with the expiration of ODS contracts and reductions in MSC charters. This table does not distinguish between MSP vessels -- which have age limits and account for the majority of U.S.-flag vessels in international trade - as compared to non-MSP vessels which do not have an age requirement.

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[72] Bloom, M., "The Cargo Preference Act of 1954 and Related Legislation." 39 Journal of Maritime Law and Commerce 3, pp. 302-304 (2008).
[73] 46 USC Section 55305(a), http://www.law.cornell.edu/uscode/text/46/55305.
[74] Bloom, M. 2008. "The Cargo Preference Act of 1954 and Related Legislation." Journal of Maritime Law and Commerce 39(3), pp. 303.
[75] The "three year rule" was added to the 1954 Act in September 1961 under P.L. 87-266. The title of the Act reveals one of its intended purposes, "An Act to Amend the Merchant Marine Act, 1936, as amended, to Encourage the Construction and Maintenance of American-Flag Vessels Built in American Shipyards." For more information see: S. Rep. No. 667, 87th Cong., 1st Sess. (1961), *reprinted in* 1961 U.S.C.C.A.N. 2806.
[76] Ibid, Bloom, p. 204.

Table 12: Average Vessel Age of U.S.-Flag International Trade Vessels since 1990 (in Years)

Year	All Vessels	Liner Vessels			Dry Bulk Carriers	Tanker
		Containerships	General Cargo	Roll-On/Roll-Off		
1990	13.7	11.6	21.1	8.9	7.3	13.9
1991	14.3	12.6	22.1	9.9	8.3	14.2
1992	14.9	13.6	22.3	11.1	9.3	14.0
1993	15.6	14.2	23.3	11.2	10.3	15.0
1994	16.1	14.9	23.6	12.4	11.8	15.2
1995	16.4	15.8	23.0	13.4	12.3	16.0
1996	16.7	15.3	23.3	14.4	13.2	16.9
1997	17.0	15.6	24.0	15.3	14.4	17.6
1998	16.3	13.8	23.9	15.6	15.9	18.4
1999	16.3	13.5	24.3	14.7	15.4	19.2
2000	15.6	14.0	20.1	15.8	16.0	20.0
2001	15.5	15.0	19.9	16.0	12.8	16.2
2002	15.8	15.7	18.0	17.0	13.8	7.0
2003	16.6	16.3	20.3	17.5	14.8	2.5
2004	16.3	16.2	16.8	18.5	14.0	3.5
2005	15.5	15.4	17.8	17.2	13.3	5.2
2006	15.7	15.1	18.8	18.0	14.3	6.0
2007	14.7	13.2	17.2	18.2	15.3	6.8
2008	14.9	13.7	18.2	17.0	16.3	7.6
2009	13.9	12.4	18.3	15.8	17.3	8.6
2010	13.7	13.0	17.3	13.3	18.3	8.2
2011	13.5	13.7	15.3	13.0	15.4	8.9
2012	13.8	15.4	13.4	13.2	10.0	4.8
2013	13.4	13.6	14.5	14.4	11.0	5.8
2014	14.3	14.9	15.8	14.4	12.0	7.0

PROJECTED IMPACTS OF CHANGES IN CARGO PREFERENCE VOLUMES ON THE U.S.-FLAG FLEET

This section of the report evaluates the impact of future trends in preference cargo volumes and attempts to project the impact of future changes in preference cargo on the size of the international trading U.S.-flag fleet. To accomplish this, MARAD used standard statistical methods and available data to evaluate the relationship and impact of changes in cargo volumes on the size of the U.S.-flag international trading fleet.

For several reasons, the focus of this analysis is on vessel numbers rather than total amount of fleet deadweight tonnage. While likely more efficient in a higher volume commercial market, one vessel of 50,000 dwt may not have the same utility for sealift availability as two vessels of 25,000 dwt each. In the event of an emergency, by using the smaller vessels, needed cargo amounts could also be loaded at two different locations at the same time if required. Moreover, these cargoes can be dispatched to two locations at the same time if needed. Further, these vessels can be loaded closer to a full shipload than can larger vessels. This flexibility may reduce U.S.-flag vessel response time which may be critical to the success of a military or humanitarian aid mission that must be carried on U.S.-flag vessels, especially when vessel size is considered in conjunction with the entire transportation network to maximize flexibility and permit nimble responses in emergencies. Additionally, the destination ports for sealift cargoes are often less developed and may not have the channel depth or port facilities needed to accommodate the larger vessel. Another important reason for considering vessel numbers is that each vessel, whether 50,000 dwt or 25,000 dwt, employs a crew of about the same size. Thus, although the one large vessel has the same total cargo capacity as the two smaller ones, a large vessel and a smaller vessel require roughly the same number of mariners—so tracking vessels may provide a useful indicator of the mariners required for Government reserve sealift assets in time of national emergency. Accordingly, MARAD tracks fleet size with regard to sealift support primarily by vessel numbers and vessel types.

As described above, DOD, USAID and USDA provided data on cargo preference volumes. Figures 4 through 6 summarize the past and projected trends for preference cargoes based on Tables 1 through 7. While DOD had plans allowing projections of future DOD volumes, for reasons discussed above, food aid and other civilian cargoes were straight-lined for this analysis. As is apparent, liner-type vessel numbers appear to follow the trend of available non-bulk dry preference cargo through 2013, and to a lesser extent the same is true for dry bulk ships. The trend in tanker vessels does not follow the availability of liquid preference cargo, and may reflect the extremely large amount of long-term tanker charters early in the period (but which are not reflected in a comparable volume of liquid preference cargo in the early part of the analysis period).

Figure 4: Historical and Projected Non-Bulk Dry Preference Cargo and Historical Vessel Numbers

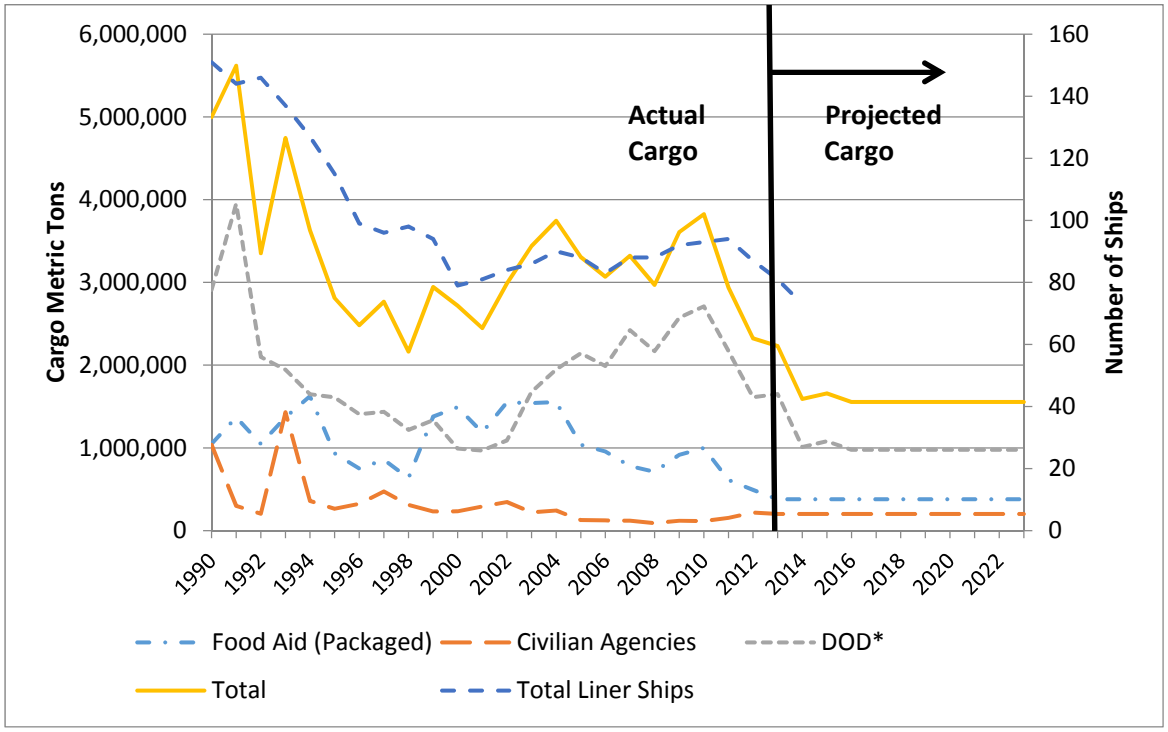


Figure 5: Historical and Projected Bulk Dry Preference Cargo and Historical Vessel Numbers

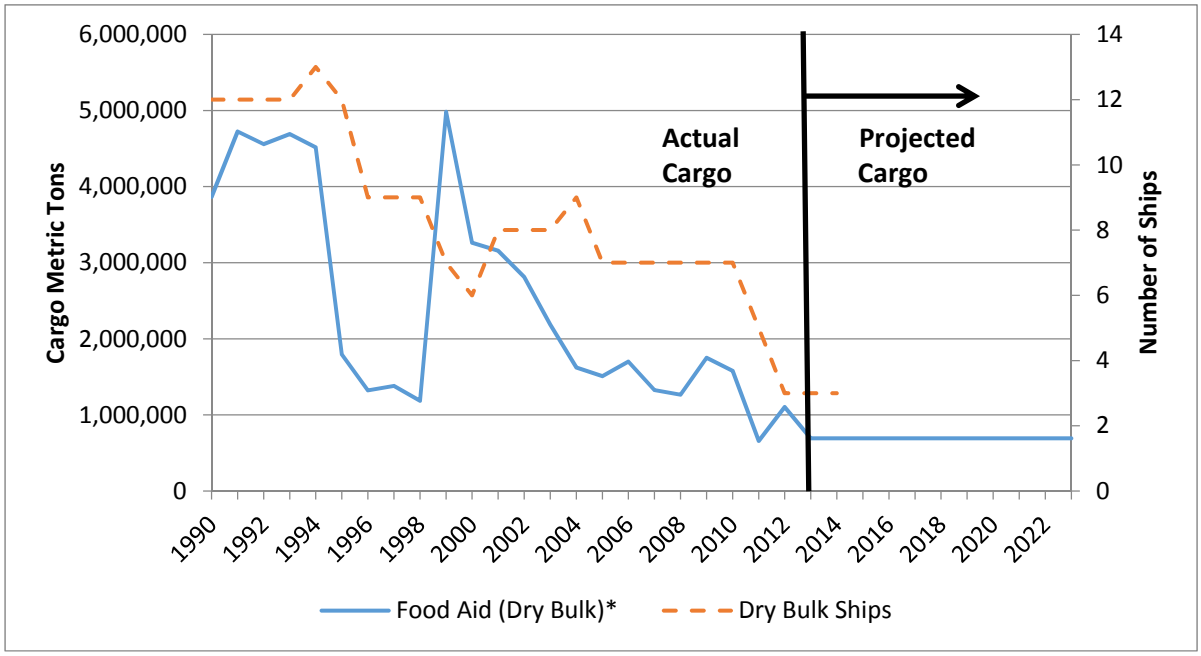
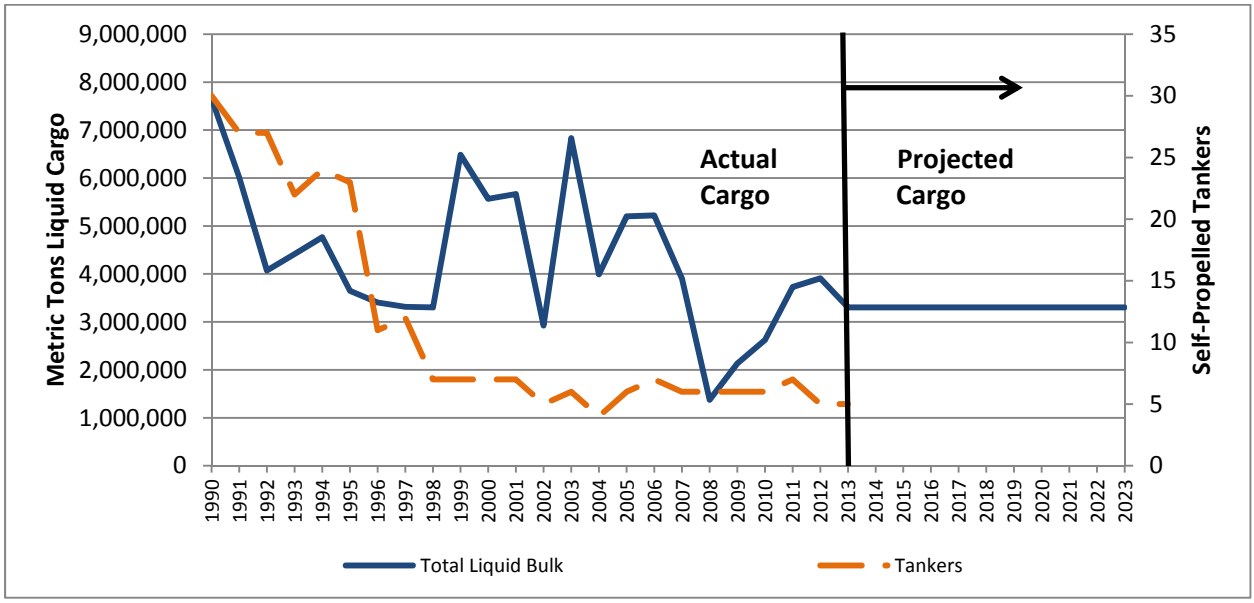


Figure 6: Historical and Projected Liquid Preference Cargo and Historical Vessel Numbers



Statistical Method for Liner Type Vessels

Although Figure 4 suggests common trends between ship numbers and preference cargo volumes, prior material presented in this report indicate other factors also played a role in influencing the number of U.S.-flag international trade vessels. As noted earlier in this analysis, other factors, such as ODS and MSP contracts, also play a role, but are difficult to display together graphically. Accordingly, MARAD estimated a series of basic statistical equations to determine the relationships of these factors to vessel numbers:

$$y = +b_0 + b_1X_1 + b_2X_2 + b_3X_{3+} b_4y_{t-1+}\varepsilon$$

Where:

- y = log of number of U.S.-flag international trading vessels as of end of each year
- b_0 = number of vessels when the independent variables are set to zero
- X_1 = number of U.S.-flag international trading vessels receiving ODS support during a year
- b_1 = factor estimated by the statistical process that, when multiplied by X_1, indicates the number of vessels associated with a given level of X_1
- X_2 = number of U.S.-flag international trading vessels receiving MSP support during a year
- b_2 = factor estimated by the statistical process that, when multiplied by X_2, indicates the number of vessels associated with a given level of X_2
- X_3 = log of total metric tons of preference cargo carried by U.S.-flag ships during a year
- b_3 = factor estimated by the statistical process that, when multiplied by X_3, indicates the number of vessels associated with a given level of X_3

b_4 = lagged dependent variable.

The statistical procedure is intended to identify the comparative association of each of the above "X" variables to the number of vessels ("y") in the fleet each year. The estimated value of the "b" factor for its associated "X" variable (e.g., cargo preference tonnage) will have a positive (+) sign if an upward change in "X" is associated with an upward movement in the number of vessels in the U.S.-flag fleet. This relationship is referred to as a positive correlation. It will have negative sign if an upward change in "X" is associated with a downward change in the number of vessels (i.e., the variables are negatively correlated). These estimated factors can also be tested to see if they are statistically significant or simply accidental (attributable to random chance). It is important to note that the statistical method does not prove causality (i.e., that a change in "X" causes a change in "y"), although causality may be inferred based on the hypothesis being tested.

The selection of the independent variables above is based on testing the following assumptions:

- Preference cargo: Year-to-year volumes of total preference cargo will be positively associated with the numbers of vessels in the fleet.
- U.S. Government support: Numbers of vessels receiving MSP or ODS payments will be positively associated with the numbers of vessels in the fleet.

The equation built from these variables was tested separately for the number of liner, dry bulk and liquid bulk (tanker) vessels, since bulk cargoes move in larger lot sizes than do liner cargoes and generally at lower per ton costs. In general, a given quantity of bulk cargo will employ significantly fewer vessels than would the same volume of liner cargo. Only the liner equation was statistically significant and is reported here.

Upon estimating the relationships between the "X" variables and "y" vessel numbers, the equation can be used to forecast future numbers of vessels by inserting projections of future volumes of preference cargoes and numbers of MSP contracts into the equation by year.

MARAD used a 24-year data time series (1990-2013) to measure the relationship among the variables. This long time series allows for a more robust statistical estimation of relationships among variables. Different preference cargo types are used to model trends of different vessel types, such as non-bulk dry cargo for liner-type vessels, dry bulk preference cargoes for dry bulk vessels and liquid bulk cargoes for tanker vessels.

Cargo preference data are measured in thousand metric tons carried by U.S.-flag vessels in each year. The relationships of actual cargo preference volumes by year and cargo type to volumes by year and type are shown in Appendix III of this report.

Analysis Scenarios for Liner Type Vessels

MARAD initially estimated the total number of liner-type vessels based on the total pool of non-bulk dry preference cargo, including bagged food aid, civilian agency cargo, and DOD military cargo; and total vessels operating under MSP and ODS contracts. Average vessel size

was considered as an independent variable, but was not included in the equation because it was not found to be statistically significant.[77] A critical assumption in this approach is that all liner-type vessels have equal access to all non-bulk dry preference cargo, which is not entirely accurate, but which also cannot be tested due to a lack of vessel-specific cargo histories.

This analysis provided the following results:

Log Liners = 0.48 + 0.004*number of ODS contract vessels + 0.0012*number of MSP contract vessels + 0.1*log(metric tons of non-bulk dry cargo preference cargo)+0.54*log(previous liner)

All of the variables have the expected signs and are statistically significant (see Appendix III). Used as a forecasting tool the equation indicates that expected reductions in cargo preference volumes could reduce the size of the U.S.-flag international trade liner fleet by three vessels by 2023. It is important to note that these projections for 2014 and beyond are based on data provided through 2013 and that the actual size of the U.S.-flag international trading fleet was at 73 at the end of 2014.

Our industry outreach indicates that most MSP vessels must carry military and civilian preference cargoes to remain under the U.S. flag. The MSP stipend covers no more than two-thirds of the operating cost differential between U.S.-flag and foreign-flag liner vessels, leaving the remainder to be covered from other resources such as revenues on government-impelled and commercial cargoes or other government measures including the tonnage tax.[78]

Industry raised the possibility that vessel losses may increase preference cargo volumes fall below a certain critical threshold. This possibility is consistent with the assumption that MSP cannot (at least at current stipend levels) support a vessel without access to adequate cargo.[79] Vessels not receiving MSP are even more dependent on preference cargo, and account for all of the net departures of U.S.-flag international trading vessels in recent years.

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[77] Average ship size failed the t-test as a significant variable. Because the effect of the ship size variable is indeterminate, and no consistent direction of the effect was found empirically, the variable is not useful as an explanatory variable.

[78] The MSP operating cost differential is as of 2010, see footnote 52. The tonnage tax provides an option for U.S.-flag vessel owners of ships greater than 10,000 deadweight tons to base taxes on vessel tonnage rather than annual profits. This provides a predictable tax liability and reduces taxes in profitable years.

[79] One mechanism by which departures might increase would involve freight rate increases. As cargo opportunities diminish, higher U.S. operating costs could only be covered by increasing freight rates to make up for lower preference cargo volumes, leading to a growing divergence between U.S.-flag and foreign-flag shipping rates. Shipper agencies could, at some point, opt for more foreign-flag service based on U.S.-flag rates not being fair and reasonable. This has always occurred at some level, and is one of the reasons that less than 100 percent of military cargoes move on U.S.-flag vessels, and it could become more severe. If so, the overall effect could hit the carriers abruptly, accelerating cargo losses and forcing vessels out more quickly. Alternatively, carriers could opt to reduce fleet size more rapidly to free up more preference cargo for their remaining U.S.-flag vessels.

Recent communications from the industry to MARAD suggest that this threshold may have already been reached or may be near. Specifically, representatives of some MSP operators have told MARAD unofficially that the operating cost differential that they are experiencing relative to foreign-flag vessels is growing larger than the $4.6 million per vessel estimate made by MARAD for 2009 and 2010.[80] In one instance, an operator reduced its presence in the MSP by one vessel because available preference cargo was not sufficient to justify continued commercial operations under the U.S.-flag. At the same time, MARAD anticipates that operators of other vessels are willing to fill open MSP slots, should they become available. Were the slots eventually to go unfilled, the current level of 58 liner-type ships in MSP might be reduced (thus providing more preference cargo per remaining ship and possibly stabilizing the MSP fleet with current stipends and preference cargo levels returning to the level of the late 1990s).

Analysis Scenarios for Dry Bulk Vessels

The method described for liners did not produce a statistically significant result for bulk vessels. Because of difficulties with predicting dry bulk cargo volumes the future cargoes were assumed be constant from 2013 levels. Therefore, MARAD did use a statistical model to forecast the future number of self-propelled dry bulk ships.[81] Thus, it is expected that the number of dry bulk ships in the fleet will remain at three throughout the forecast period.[82]

Analysis Scenarios for Tanker Vessels

MARAD estimated the relationship between the total number of self-propelled liquid bulk ships (tankers) and three independent variables: the total quantity of liquid preference cargo (largely DOD petroleum shipments, with some civilian agency cargo); vessels receiving ODS, and vessels receiving MSP.[83] Average ship size was considered as an independent variable, but for reasons described earlier in this paper, was not included. As noted earlier, dry bulk cargoes are also carried by tankers from time to time, but this practice is much less frequent today than it was a decade ago and was not estimated in this scenario due to a lack of consistent data on this practice. The result is not reported here because it was not statistically significant.

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[80] Maritime Administration, Comparison of U.S. And Foreign-Flag Operating Costs, September 2011, pp. 10-11, http://www.marad.dot.gov/documents/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf.

[81] Some tug and barge vessels operating under the U.S.-flag are used to move government-impelled cargoes, particularly to locations nearby to the United States such as in the Caribbean. There are large numbers of these vessels but they are generally not considered to be militarily useful, nor are their crews generally trained to operate large oceangoing self-propelled vessels needed for military sealift.

[82] Some dry bulk preference cargo included in this section may have been carried by tankers, however a full breakout of cargo carried on dry-bulk ships and tankers is not available.

[83] Some tug and barge vessels operating under the U.S. flag are used to move government-impelled cargoes, particularly to locations nearby to the United States such as in the Caribbean region. There are large numbers of these vessels but they are generally not considered to be militarily useful, nor are their crews generally required to be trained to operate large oceangoing self-propelled vessels needed for military sealift.

The U.S.-flag self-propelled international trading tanker fleet has only five vessels as of the end of 2014. These ships are important for the military to carry fuel.

PROJECTED IMPACTS OF CHANGES IN CARGO PREFERENCE VOLUMES ON U.S. MARINERS

Each vessel leaving the U.S.-flag fleet in international commerce will result in a reduction of "blue water" U.S. mariner jobs in that commerce to the extent that it is not replaced by another vessel. The ability to crew and operate its reserve sealift fleet to meet military sealift requirements depends on having sufficient mariners available in time of national emergency. It is important to note, however, that civilian and military needs have fluctuated over the last 24 years. Taking into account only U.S. merchant mariners, the pool includes those who have obtained and maintained their unlimited ocean and tonnage endorsements. These mariners mainly include those involved in international commerce and those engaged in U.S. coastwise trade who hold the necessary international training endorsements that are required to crew large oceangoing ships.[84]

Self-propelled oceangoing vessels engaged in the carriage of preference cargo (the subject of this report) can have as few as 16 crew positions (referred to as "billets") to as many as 25 billets, based largely on the minimum crewing levels established by the U.S. Coast Guard taking into consideration the design and mission of the vessel.[85] Because crew members rotate over the course of a year each billet generates approximately two mariner jobs per year. In this analysis, an average vessel is assumed to have 20 billets employing 40 mariners per year.

The sufficiency (availability, commitment and skills) of this mariner pool to support a large-scale activation of the government reserve sealift fleet, including the 46 vessels[86] in the MARAD-owned Ready Reserve Force (RRF) and 14 vessels in the MSC's Surge sealift program,[87] currently depends principally upon the health and size of the commercial U.S.-flag merchant fleet participating in international trade.

When U.S. merchant mariners are not actively sailing, they typically do not maintain their memberships in the U.S. maritime labor unions, which have collective bargaining agreements to

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[84] The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

[85] Vessels that have crew sizes of fewer than 16 positions are generally articulated tug and barge units that move cargoes between the United States and Caribbean locations or in other short haul services.

[86] U.S. Department of Transportation, Maritime Administration, "The Maritime Administration's Ready Reserve Force," http://www.marad.dot.gov/ships_shipping_landing_page/national_security/ship_operations/ready_reserve_force/ready_reserve_force.htm.

[87] U.S. Navy, Military Sealift Command, Sealift (PM5), http://www.msc.navy.mil/PM5/. Includes 9 Large, Medium-Speed RoRos and 5 Containers and RO/RO vessels.

crew the reserve sealift fleet. The cost for unlimited ocean and tonnage credentialed merchant mariners to maintain both domestic and international training endorsements on their U.S, Coast Guard Merchant Mariner Credential, which will increase in January 2017 as the U.S. comes into compliance with new International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers requirements, may cause mariners who are not actively sailing to place their credentials in continuity[88] or allow them to expire. Merchant mariners in this position may not be readily available to crew the reserve sealift fleet and may require additional training to reinstate their U.S. Coast Guard credentials depending, for example, on when their credentials were placed in continuity or expired.[89]

While the quantitative analysis indicates that the size of the U.S.-flag international liner trading fleet of privately-owned, self-propelled vessels could fall from 79 liner vessels as of the beginning of 2014 to 76 in 2023 with an associated loss of 120 mariners, the actual size of the liner fleet was already at 73 vessels at the end of 2014. Based on the 95% confidence interval for the quantitative analysis, the range in 2023 is 64 to 110 total private-owned self-propelled vessels. The number of vessels in the total U.S.-flag international trading fleet has fallen from 106 at the beginning of 2011 to 81 at the end of 2014, representing a loss of 25 vessels and up to 1,000 mariner jobs. The loss of any vessel can potentially have an impact on the availability of commercial mariners to crew Government reserve sealift assets.

CONCLUSION

This report was produced in response to Congressional direction provided in the Consolidated Appropriations Act, 2014, P.L. 113-76, to analyze the current and future impacts of reductions in government impelled cargo on the U.S. Merchant Marine. To conduct this analysis, MARAD studied the prior history of factors influencing employment for the U.S.-flag fleet of privately-owned oceangoing vessels engaged in international trade. Among factors studied were volumes of cargo preference moved on U.S.-flag vessels since 1990, numbers of vessels under ODS or MSP contracts, numbers of vessels under MSC long-term charters, and average vessels

[88] Per 46 CFR 10.227 Applicants for renewal of national endorsements, who are unwilling or otherwise unable to meet the requirements to renew their credential, including but not limited to the medical and physical standards, suitability standards, drug tests, professional requirements, and Transportation Worker Identification Card, may apply for a Document of Continuity issued by the Coast Guard. Documents of Continuity do not expire and are issued solely to maintain an individual's eligibility for renewal. A Document of Continuity does not entitle an individual to serve as a merchant mariner.

[89] To estimate the actively sailing pool of qualified mariners, MARAD uses data from the U.S. Coast Guard (USCG) Merchant Mariner Licensing and Documentation (MMLD) system. Historically, the methodology used to determine the actively sailing pool included data on mariners who had sailed within the past 24 months. This was based on analysis of crewing practices and MMLD data entry delays. Testimony from the May 21, 2013 hearing (House Subcommittee on Coast Guard and Maritime Transportation: The Role of U.S. Ships and Mariners) revealed updated information from the USCG on the timeliness of MMLD data entry and new crewing practices from labor union leaders. Based on this new information, MARAD revalidated all assumptions regarding its methodology for estimating the actively sailing pool of mariners which resulted in revising to include data on mariners who had sailed within the past 18 months to determine the “actively sailing” pool. However, the maritime unions that collect these data are not required to provide to or verify them for any Federal agency.

sizes and ages. MARAD then used statistical data on the relationships of these factors to fleet size to project the future size of the fleet based on projections of cargo preference volumes provided by DOD, USAID, USDA and other government agencies.

The findings of this report are that overall cargo preference volumes will likely decrease over the next two to three years, returning to the levels of the late 1990s as the war efforts in Iraq and Afghanistan wind down. Food aid will continue fluctuate for a number of reasons including the nature of food emergencies, the variability of food prices and the costs of transportation and distribution. Our quantitative analysis indicates that in 2023, there may be 76 liner vessels in the U.S.-flag international trading fleet of privately-owned, self-propelled vessels, with an estimated loss of 120 mariner jobs. The actual loss since the end of 2010 for all vessels in the U.S.-flag international trading fleet has been 25 ships (20 liner, 4 dry bulk, and 1 liquid bulk) representing roughly 1,000 mariners. Based on the 95% confidence interval for the quantitative analysis, the range in 2023 is 64 to 110 total privately-owned self-propelled vessels, with associated changes in mariner jobs ranging from a loss as of the end of 2014 of up to an additional 680 jobs to a gain of up to 1,160 jobs. The quantitative analysis further shows that through 2023 the size of the U.S.-flag international trading fleet will at best recover to a level similar those observed in 1999, 2010, and 2011, and will likely remain at or below the current size of 81 given current forecasts of preference cargo. Accordingly, the number of mariner jobs is estimated to follow a similar trend, likely to either remain constant or decline from the period before 2010. We did not estimate how many new positions, if any, might be available for mariners in Jones Act trade over this period. It is expected that any decline will be in liner-type vessels, with impacts on the MSP likely.

Due to extensive training and licensing requirements that come into effect in January 2017 it may be difficult to recruit and retain seafarers if there are insufficient jobs. Similarly, those mariners who lose jobs are unlikely to remain current in licensing and training for a period of more than 18 months. This applies to international trade and mariners with unlimited ocean and tonnage endorsements from the U.S. Coast Guard. Global economic growth has produced a robust job market in maritime commerce governed by the Jones Act.

Under the status quo preference cargoes will likely return to the level of late 1990s. Winding down military actions and reductions in U.S. bases in foreign countries will likely lead to sustained reductions in DOD cargoes relative to peak level reached in the prior decade. Food aid volumes fluctuate significantly and are currently below the peaks reached periodically over the last 24 years.

MARAD is currently working on developing a National Maritime Strategy that will consider a comprehensive range of actions to preserve and grow all aspects of the U.S. Merchant Marine, including the U.S.-flag international trading fleet. The strategy is all the more important due to the critical role that the U.S.-flag fleet plays in providing the vessels and mariners needed to globally project our armed forces.

Appendix I Summary of U.S.-Flag Privately-Owned Merchant Fleet 1990-2014

Table A1: U.S.-Flag Privately-Owned, Non-Jones Act Eligible, Merchant Fleet 1990-2014 (Deadweight Tons (dwt) in 1,000s)

Year	Total Ships	Total DWT	Container-ship	Containership DWT	RoRo	Ro/Ro DWT	General Cargo	General Cargo DWT	Total Liner Ships	Total Liner DWT	Dry Bulk Carrier	Dry Bulk Carrier	Tanker	Tanker DWT	Total Dry Bulk and Tanker	Total Dry Bulk and Tanker
1990	199	8,302,925	80	2,696,270	24	461,579	47	944,278	151	4,102,127	12	567,216	36	3,633,582	48	4,200,798
1991	188	7,800,077	80	2,696,270	24	461,579	40	853,823	144	4,011,672	12	567,216	32	3,221,189	44	3,788,405
1992	188	7,591,514	80	2,696,270	26	500,917	40	896,622	146	4,093,809	12	567,216	30	2,930,489	42	3,497,705
1993	176	6,432,614	77	2,643,770	22	430,717	38	880,322	137	3,954,809	12	567,216	27	1,910,589	39	2,477,805
1994	166	6,168,495	74	2,584,951	21	404,217	32	785,822	127	3,774,990	13	658,616	26	1,734,889	39	2,393,505
1995	151	5,610,484	69	2,374,451	21	409,098	25	620,930	115	3,404,479	12	567,216	24	1,638,789	36	2,206,005
1996	126	4,748,618	55	1,983,651	21	409,098	23	584,330	99	2,977,079	9	436,350	18	1,335,189	27	1,771,539
1997	121	4,307,472	58	2,100,405	19	391,098	19	523,130	96	3,014,633	9	436,209	16	856,630	25	1,292,839
1998	118	4,262,165	61	2,382,737	18	364,828	19	549,037	98	3,296,602	9	425,274	11	540,289	20	965,563
1999	110	3,904,241	53	2,113,442	21	417,088	20	535,189	94	3,065,719	7	374,333	9	464,189	16	838,522
2000	92	3,435,188	50	2,074,542	20	403,588	9	233,236	79	2,711,366	6	339,833	7	383,989	13	723,822
2001	95	3,533,372	52	2,183,922	21	415,378	8	183,378	81	2,782,678	8	441,035	6	309,659	14	750,694
2002	95	3,473,924	54	2,349,347	21	415,378	9	194,484	84	2,959,209	8	441,035	3	73,680	11	514,715
2003	96	3,510,168	53	2,385,294	22	435,262	11	208,797	86	3,029,353	8	441,035	2	39,780	10	480,815
2004	101	3,846,783	59	2,694,097	22	435,262	9	184,797	90	3,314,156	9	492,847	2	39,780	11	532,627
2005	100	3,664,836	50	2,404,035	26	526,774	12	198,698	88	3,129,507	7	366,355	5	168,974	12	535,329
2006	96	3,492,140	46	2,250,939	25	501,674	12	198,698	83	2,951,311	7	366,355	6	174,474	13	540,829
2007	100	3,794,692	53	2,604,005	25	504,845	10	149,793	88	3,258,643	7	366,355	5	169,694	12	536,049
2008	100	3,746,037	52	2,533,825	26	515,293	10	149,793	88	3,198,911	7	366,355	5	180,771	12	547,126
2009	104	4,062,353	57	2,886,743	24	470,657	11	157,827	92	3,515,227	7	366,355	5	180,771	12	547,126
2010	106	4,058,863	55	2,803,943	25	528,704	13	173,415	93	3,506,062	7	366,355	6	186,446	13	552,801
2011	106	4,009,987	56	2,820,121	23	480,379	15	207,050	94	3,507,550	5	277,814	7	224,623	12	502,437
2012	95	3,632,775	50	2,599,275	22	463,837	15	222,339	87	3,285,451	3	153,014	5	194,310	8	347,324
2013	89	3,569,055	46	2,566,397	21	440,407	14	214,927	81	3,221,731	3	153,014	5	194,310	8	347,324
2014	81	3,450,864	45	2,559,544	19	396,513	9	145,162	73	3,101,219	3	153,014	5	196,631	8	349,645
Avg Δ	-4.9	(202,169)	-1.5	(5,697)	-0.2	(2,711)	-1.6	(33,297)	-3.3	(41,705)	-0.4	(17,258)	-1.3	(143,206)	-1.7	(160,465)
Avg Δ 2000-2013	-0.8	1,120	-0.4	34,643	-0.1	(505)	0.0	(6,291)	-0.4	27,847	-0.2	(13,344)	-0.1	(13,383)	-0.4	(26,727)
Average Rate of Change	-3.7%	-3.6%	-2.4%	-0.2%	-1.0%	-0.6%	-6.7%	-7.5%	-3.0%	-1.2%	-5.6%	-5.3%	-7.9%	-11.4%	-7.2%	-9.8%
MSP 2014	60	2,804,208	37	2,277,862	16	357,469	5	65,455	58	2,700,786			2	103,422		
Non-MSP 2014	21	646,656	8	281,682	3	39,044	4	79,707	15	400,433	3	153,014	3	93,209		

Table A2: U.S.-Flag Privately-Owned, Jones Act Eligible, Merchant Fleet 1990-2014 (Deadweight Tons (dwt) in 1,000s)

Year	Total Ships	Total DWT	Container ship	Container ship DWT	RO/RO	RO/RO DWT	General Cargo	General Cargo DWT	Total Liner Ships	Total Liner DWT	Dry Bulk Carrier	Dry Bulk Carrier DWT	Tanker	Tanker DWT	Total Dry Bulk and Tanker	Total Dry Bulk and Tanker DWT
1990	207	12,314,888	9	207,700	14	266,333	0	-	23	474,033	10	398,956	174	11,441,899	184	11,840,855
1991	201	11,745,188	9	207,700	14	266,333	0	-	23	474,033	10	398,956	168	10,872,199	178	11,271,155
1992	196	11,214,469	9	207,700	14	266,333	0	-	23	474,033	10	398,956	163	10,341,480	173	10,740,436
1993	183	10,159,996	10	231,700	13	252,333	0	-	23	484,033	10	398,956	150	9,277,007	160	9,675,963
1994	184	10,135,069	13	295,100	14	278,833	2	37,000	29	610,933	10	398,956	145	9,125,180	155	9,524,136
1995	166	9,419,991	13	295,100	14	278,833	1	22,300	28	596,233	9	374,959	129	8,448,799	138	8,823,758
1996	177	9,706,916	25	642,414	14	278,833	2	44,600	41	965,847	6	168,570	130	8,572,499	136	8,741,069
1997	165	9,073,440	24	616,114	14	278,833	2	44,600	40	939,547	6	157,994	119	7,975,899	125	8,133,893
1998	163	8,972,933	27	688,814	14	278,833	2	44,600	43	1,012,247	5	132,094	115	7,828,592	120	7,960,686
1999	174	9,372,064	33	898,009	14	264,383	3	64,600	50	1,226,992	7	183,535	117	7,961,537	124	8,145,072
2000	180	8,315,375	33	913,895	14	264,383	14	303,742	61	1,482,020	5	331,735	114	6,501,620	119	6,833,355
2001	166	7,305,504	33	913,895	14	264,383	12	202,372	59	1,380,650	6	368,979	101	5,555,875	107	5,924,854
2002	151	6,560,444	30	850,995	14	264,383	9	79,672	53	1,195,050	6	368,979	92	4,996,415	98	5,365,394
2003	135	5,531,502	28	802,195	15	291,773	11	107,014	54	1,200,982	6	368,979	75	3,961,541	81	4,330,520
2004	130	5,599,807	28	819,856	15	291,773	9	79,672	52	1,191,301	6	368,979	72	4,039,527	78	4,408,506
2005	130	5,628,804	29	858,117	17	328,434	10	81,168	56	1,267,719	5	159,779	69	4,201,306	74	4,361,085
2006	125	5,522,319	28	816,044	14	247,534	10	81,168	52	1,144,746	5	159,779	68	4,217,794	73	4,377,573
2007	125	5,568,786	29	828,462	14	247,534	10	81,168	53	1,157,164	5	159,779	67	4,251,843	72	4,411,622
2008	117	5,270,613	28	812,362	12	196,934	10	60,068	50	1,069,364	5	159,779	62	4,041,470	67	4,201,249
2009	117	5,325,978	27	791,762	12	196,934	9	37,768	48	1,026,464	5	159,779	64	4,139,735	69	4,299,514
2010	108	5,003,639	27	791,762	11	171,834	9	37,768	47	1,001,364	5	159,779	56	3,842,496	61	4,002,275
2011	92	4,187,276	27	791,762	11	171,834	9	37,768	47	1,001,364	3	104,590	42	3,081,322	45	3,185,912
2012	92	4,214,071	27	791,762	10	153,934	9	37,768	46	983,464	3	104,590	43	3,126,017	46	3,230,607
2013	90	4,202,131	25	750,162	9	137,834	9	37,768	43	925,764	3	104,590	44	3,171,777	47	3,276,367
2014	87	4,251,324	24	728,462	8	120,891	7	10,604	39	859,957	3	104,590	45	3,286,777	48	3,391,367
Avg Δ	-5.0	(335,982)	0.6	21,698	-0.3	(6,060)	0.3	442	0.7	16,080	-0.3	(12,265)	-5.4	(339,797)	-5.7	(352,062)
Avg Δ 2000-2013	-6.6	(290,289)	-0.6	(13,245)	-0.4	(10,249)	-0.5	(20,938)	-1.6	(44,433)	-0.1	(16,225)	-4.9	(229,632)	-5.1	(245,856)
Average Rate of Change	-3.5%	-4.3%	4.2%	5.4%	-2.3%	-3.2%	6.5%	-6.1%	2.2%	2.5%	-4.9%	-5.4%	-5.5%	-5.1%	-5.4%	-5.1%

Appendix II Vessel in the U.S.-flag Merchant Fleet as of January 2015

Table A1

U.S. Maritime Administration
United States Flag Privately-Owned International Trading Merchant Fleet
Oceangoing, Self-Propelled, Cargo-Carrying vessels of 1,000 gross tons and above
As of: 1/22/2015

IMO #	Vessel Name	Vessel Type	Gross Tonnage	Deadweight	Year Built	Operator	MSP	VISA	VTA
7515339	ADVANTAGE	General Cargo	18296	27750	1977	Sealift Inc	N	Y	N
9303546	ALLIANCE FAIRFAX	Ro-Ro	59705	19670	2005	Farrell Lines Inc	Y	Y	N
9332547	ALLIANCE NORFOLK	Ro-Ro	57280	21500	2007	Farrell Lines Inc	Y	Y	N
9285500	ALLIANCE ST. LOUIS	Ro-Ro	57280	15880	2005	Farrell Lines Inc	Y	Y	N
9139713	APL AGATE	Containership	65475	63693	1997	APL Ltd	Y	Y	N
9218686	APL BELGIUM	Containership	65792	67500	2002	APL Ltd	N	Y	N
9074389	APL CHINA	Containership	64502	66520	1995	APL Ltd	Y	Y	N
9139749	APL CORAL	Containership	65475	64145	1998	APL Ltd	Y	Y	N
9139725	APL CYPRINE	Containership	65475	64157	1997	APL Ltd	Y	Y	N
9074535	APL KOREA	Containership	64502	66520	1995	APL Ltd	Y	Y	N
9139737	APL PEARL	Containership	65475	64050	1998	APL Ltd	Y	Y	N
9077276	APL PHILIPPINES	Containership	64502	65642	1996	APL Ltd	Y	Y	N
9074547	APL SINGAPORE	Containership	64502	66520	1995	APL Ltd	Y	Y	N
9077123	APL THAILAND	Containership	64502	66520	1995	APL Ltd	Y	Y	N
8124371	BLACK EAGLE	Containership	31041	32709	1983	Sealift Inc	N	Y	N
9123037	CAPT DAVID I. LYON	Containership	16803	22878	1996	Sealift Inc	N	N	N
8313661	CAPT STEVEN L. BENNETT	General Cargo	29226	41151	1984	Military Sealift Command	N	Y	N
9243162	CHARLESTON EXPRESS	Containership	40146	40478	2002	Hapag-Lloyd Ag	Y	Y	N
8919922	COURAGE	Ro-Ro	52288	29213	1991	American Roll-On Roll-Off	Y	Y	N
9457218	CRAGSIDE	Ro-Ro	29429	11325	2011	DFDS A/S	N	N	N
9121273	ENDURANCE	Ro-Ro	72708	48988	1996	American Roll-On Roll-Off	Y	Y	N
8813025	EOT SPAR	Ro-Ro	2762	3095	1990	Schuyler Line Navigation Company, LLC	N	Y	N
9129706	FREEDOM	Ro-Ro	49821	19884	1997	American Roll-On Roll-Off	Y	Y	N
9181560	GREEN COVE	Ro-Ro	57566	22747	1999	LMS Shipmanagement Inc	Y	Y	N
9158288	GREEN LAKE	Ro-Ro	57623	22799	1998	NYK Line	Y	Y	N
9056296	GREEN POINT	Ro-Ro	51819	14930	1994	Sulphur Carriers Inc	Y	Y	N
9177428	GREEN RIDGE	Ro-Ro	57449	21523	1998	NYK Line	Y	Y	N
9126297	HONOR	Ro-Ro	49814	19844	1996	American Roll-On Roll-Off	Y	Y	N
9331593	HOUSTON	General Cargo	7002	7491	2005	Teras BBC Ocean Navigation	N	Y	N
9070448	INDEPENDENCE II	Ro-Ro	55598	15199	1994	American Roll-On Roll-Off	Y	Y	N
8919934	INTEGRITY	Ro-Ro	52479	29152	1992	American Roll-On Roll-Off	Y	Y	N
9278753	LIBERTY EAGLE	Dry Bulk	28762	51812	2004	Liberty Maritime Corp	N	Y	N

9228136	LIBERTY GLORY	Dry Bulk	28836	50601	2001	Liberty Maritime Corp	N	Y	N
9228148	LIBERTY GRACE	Dry Bulk	28836	50601	2001	Liberty Maritime Corp	N	Y	N
9448114	LIBERTY PRIDE	Ro-Ro	57030	21233	2009	Liberty Maritime Corp	Y	Y	N
9448425	LIBERTY PROMISE	Ro-Ro	57030	21359	2010	Liberty Maritime Corp	Y	Y	N
8212714	LTC JOHN U.D. PAGE	Containership	57075	58869	1985	Military Sealift Command	N	N	N
9164263	MAERSK ALABAMA	Containership	14120	17375	1998	Maersk A/S	Y	Y	N
9348649	MAERSK ATLANTA	Containership	74642	84676	2006	Maersk A/S	Y	Y	N
8820195	MAERSK CALIFORNIA	Containership	18979	25275	1992	Maersk A/S	Y	Y	N
9155133	MAERSK CAROLINA	Containership	50698	62229	1998	Maersk A/S	Y	Y	N
9332975	MAERSK CHICAGO	Containership	74642	84775	2007	Maersk A/S	Y	Y	N
9332987	MAERSK COLUMBUS	Containership	74642	84704	2007	Maersk A/S	Y	Y	N
9332999	MAERSK DENVER	Containership	74642	84771	2007	Maersk A/S	Y	Y	N
9333034	MAERSK DETROIT	Containership	74642	80000	2008	Maersk A/S	Y	Y	N
9333008	MAERSK HARTFORD	Containership	74642	60375	2007	Maersk A/S	Y	Y	N
9193264	MAERSK IDAHO	Containership	50698	61986	2000	Maersk A/S	Y	Y	N
9298686	MAERSK IOWA	Containership	50686	61454	2006	Maersk A/S	Y	Y	N
9193240	MAERSK KENTUCKY	Containership	50698	61986	1999	Maersk A/S	Y	Y	N
9348651	MAERSK MEMPHIS	Containership	74642	84868	2007	Maersk A/S	Y	Y	N
9255244	MAERSK MICHIGAN	Tanker	28517	47047	2003	Handytankers K/S	N	N	Y
9155121	MAERSK MISSOURI	Containership	50698	62226	1998	Maersk A/S	Y	Y	N
9305312	MAERSK MONTANA	Containership	50686	61499	2006	Maersk A/S	Y	Y	N
9298698	MAERSK OHIO	Containership	50686	61454	2006	Maersk A/S	Y	Y	N
9278492	MAERSK PEARY	Tanker	25487	38177	2004	Maersk Line Ltd-USA	N	N	Y
9342176	MAERSK PITTSBURGH	Containership	74642	84676	2008	Maersk A/S	Y	Y	N
9305300	MAERSK UTAH	Containership	50686	61454	2006	Maersk A/S	Y	Y	N
9193252	MAERSK WISCONSIN	Containership	50698	62441	2000	Maersk A/S	Y	Y	N
8320559	MAJOR BERNARD F. FISHER	Ro-Ro	34318	24500	1985	Military Sealift Command	N	N	N
9232979	MARSTAN	Containership	6368	8627	2000	Sealift Inc	N	Y	N
9100243	MOHEGAN	Containership	6158	7850	1994	Sealift Inc	N	N	N
9213959	OCEAN CHARGER	General Cargo	7252	8034	2000	Intermarine LLC	Y	Y	N
9258193	OCEAN CRESCENT	General Cargo	7252	8097	2002	Intermarine LLC	Y	Y	N
9419008	OCEAN GLOBE	General Cargo	15549	16576	2010	Intermarine LLC	Y	N	N
9506722	OCEAN FREEDOM	General Cargo	12810	14359	2010	Intermarine LLC	Y	Y	N
9437335	OCEAN GIANT	General Cargo	15549	18389	2012	Intermarine LLC	Y	Y	N
9435894	OVERSEAS MYKONOS	Tanker	29433	51711	2010	OSG Ship Management Gr Ltd	Y	N	Y
9435909	OVERSEAS SANTORINI	Tanker	29433	51711	2010	OSG Ship Management Gr Ltd	Y	N	Y
9243203	PHILADELPHIA EXPRESS	Containership	40146	40478	2003	Hapag-Lloyd Ag	Y	Y	N
9080297	RESOLVE	Ro-Ro	49443	13548	1994	American Roll-On Roll-Off	Y	Y	N
9143001	SEA-LAND CHARGER	Containership	49985	59961	1997	Maersk A/S	Y	Y	N
9106182	SEA-LAND COMET	Containership	49985	59840	1995	Maersk A/S	Y	Y	N
9143025	SEA-LAND INTREPID	Containership	49985	59840	1997	Maersk A/S	Y	Y	N

9143037	SEA-LAND LIGHTNING	Containership	49985	59840	1997	Maersk A/S	Y	Y	N
9161168	SEATTLE	General Cargo	13066	20406	1997	American Overseas Marine Co	N	N	N
9383663	SLNC PAX	Tanker	5713	7985	2008	Schuyler Line Navigation Company, LLC	N	N	N
8212673	SSG EDWARD A. CARTER JR.	Containership	57075	58943	1985	Military Sealift Command	N	N	N
9243186	ST LOUIS EXPRESS	Containership	40146	40478	2002	Hapag-Lloyd Ag	Y	Y	N
9148520	TRANSATLANTIC	General Cargo	4276	5055	1997	Transatlantic Lines LLC	N	Y	N
9243198	WASHINGTON EXPRESS	Containership	40146	40478	2003	Hapag-Lloyd Ag	Y	Y	N
9243174	YORKTOWN EXPRESS	Containership	40146	40478	2002	Hapag-Lloyd Ag	Y	Y	N

Table A2

U.S. Maritime Administration
United States Flag Privately-Owned Jones Act Qualified Merchant Fleet Report
Oceangoing, Self-Propelled, Cargo-Carrying vessels of 1,000 gross tons and above
As of: 1/22/2015

IMO #	Vessel Name	Vessel Type	Gross Tonnage	Deadweight	Year Built	Operator	MSP	VISA	VTA
9244661	ALASKAN EXPLORER	Tanker	110693	193049	2005	Alaska Tanker Co LLC	N	N	N
9244659	ALASKAN FRONTIER	Tanker	110693	193049	2004	Alaska Tanker Co LLC	N	N	N
9271432	ALASKAN LEGEND	Tanker	110693	193048	2006	Alaska Tanker Co LLC	N	N	N
9244673	ALASKAN NAVIGATOR	Tanker	110693	193048	2005	Alaska Tanker Co LLC	N	N	N
9564578	AMERICAN PHOENIX	Tanker	30718	49035	2012	Seabulk Tankers Inc	N	N	N
9144926	CALIFORNIA VOYAGER	Tanker	30770	45656	1999	Chevron Shipping Co LLC	N	N	N
8109668	CHARLESTON	Tanker	31452	48846	1983	USCS Chemical Chartering	N	N	N
6806444	CHEMICAL PIONEER	Tanker	21760	34930	1968	USCS Chemical Chartering	N	N	N
9010498	COASTAL NAVIGATOR	General Cargo	1904	1500	1991	Coastal Transportation Inc.	N	N	N
8213249	COASTAL NOMAD	General Cargo	1920	1200	1983	Coastal Transportation Inc.	N	N	N
8855463	COASTAL PROGRESS	General Cargo	1920	1200	1988	Coastal Transportation Inc.	N	N	N
5408491	COASTAL TRADER	General Cargo	1823	1825	1963	Coastal Transportation Inc.	N	N	N
7119678	COASTAL VENTURE	General Cargo	1301	1383	1971	Stevens Transportation LLC	N	Y	N
9198501	DELTA MARINER	Ro-Ro	8679	3950	2000	Foss Maritime Co	N	Y	N
7408081	EAGLE FORD	Tanker	64329	124644	1978	Seabulk Tankers Inc	N	N	N
7395351	EL FARO	Ro-Ro	31515	17915	1975	Sea Star Line LLC	N	Y	N
7506015	EL YUNQUE	Ro-Ro	28137	16144	1976	Sea Star Line LLC	N	Y	N
9408126	EMPIRE STATE	Tanker	29527	48635	2010	Crowley Petroleum Service	N	N	N
8026799	ENERGY ENTERPRISE	Dry Bulk	28250	33373	1983	International Shipholding Corp	N	N	N
9408138	EVERGREEN STATE	Tanker	29606	48641	2010	American Petroleum Tankers LLC	N	N	N
9568469	FLORIDA	Tanker	29242	45760	2013	Crowley Petroleum Service	N	N	N
9118630	FLORIDA VOYAGER	Tanker	30415	46094	1998	Chevron Shipping Co LLC	N	N	N
7710733	GEYSIR	General Cargo	2266	2000	1980	Transatlantic Lines Shphldgs	N	Y	N
9407562	GOLDEN STATE	Tanker	29527	48632	2009	Crowley Petroleum Service	N	N	N
8419142	HORIZON ANCHORAGE	Containership	20965	21282	1987	Horizon Lines LLC	N	Y	N
7224306	HORIZON CONSUMER	Containership	25644	25651	1973	Horizon Lines LLC	N	Y	N
7617905	HORIZON ENTERPRISE	Containership	28219	31423	1980	Horizon Lines LLC	N	Y	N
7218462	HORIZON FAIRBANKS	Containership	20987	22086	1973	Horizon Lines LLC	N	N	N
8419166	HORIZON KODIAK	Containership	20965	20668	1987	Horizon Lines LLC	N	Y	N
7116315	HORIZON NAVIGATOR	Containership	28212	31203	1972	Horizon Lines LLC	N	Y	N
7617890	HORIZON PACIFIC	Containership	28219	31213	1979	Horizon Lines LLC	N	Y	N
7729461	HORIZON RELIANCE	Containership	34077	45895	1980	Horizon Lines LLC	N	Y	N
7729459	HORIZON SPIRIT	Containership	34077	46154	1980	Horizon Lines LLC	N	Y	N
8419154	HORIZON TACOMA	Containership	20965	20668	1987	Horizon Lines LLC	N	Y	N
7326233	HORIZON TRADER	Containership	28212	31495	1973	Horizon Lines LLC	N	Y	N
8220761	HOUSTON	Tanker	21471	32689	1985	USS Chartering LLC	N	N	N

9233167	JEAN ANNE	Ro-Ro	37548	12561	2005	Pasha Group	N	Y	N
7802718	KAUAI	Containership	25640	26350	1980	Matson Navigation Co Inc	N	Y	N
9642083	LIBERTY BAY	Tanker	62318	115000	2014	Seariver Maritime Inc	N	N	N
7105471	LIHUE	Containership	30877	38656	1971	Matson Navigation Co Inc	N	Y	N
7321087	LURLINE	Ro-Ro	30506	22030	1973	Matson Navigation Co Inc	N	Y	N
7907996	MAHIMAHI	Containership	41036	30825	1983	Matson Navigation Co Inc	N	Y	N
7907984	MANOA	Containership	41036	30825	1982	Matson Navigation Co Inc	N	Y	N
9244130	MANUKAI	Containership	32575	38261	2003	Matson Navigation Co Inc	N	Y	N
9273674	MANULANI	Containership	32575	38261	2005	Matson Navigation Co Inc	N	Y	N
7334204	MATSONIA	Ro-Ro	33095	22501	1973	Matson Navigation Co Inc	N	Y	N
7602338	MAUI	Containership	25630	24683	1978	Matson Navigation Co Inc	N	Y	N
9273686	MAUNALEI	Containership	25324	34027	2006	Matson Navigation Co Inc	N	Y	N
9268538	MAUNAWILI	Containership	32575	38261	2004	Matson Navigation Co Inc	N	Y	N
9232278	MIDNIGHT SUN	Ro-Ro	65314	22437	2003	Totem Ocean Trailer Express	N	Y	N
7929308	MISSISSIPPI ENTERPRISE	Dry Bulk	22518	37244	1980	US United Ocean Services LLC	N	N	N
9131369	MISSISSIPPI VOYAGER	Tanker	30415	46069	1998	Chevron Shipping Co LLC	N	N	N
7908005	MOKIHANA	Ro-Ro	57379	30652	1983	Matson Navigation Co Inc	N	Y	N
8302246	NATIONAL GLORY	Containership	11652	12418	1988	National Shipping Company	N	Y	N
9232280	NORTH STAR	Ro-Ro	65314	22437	2003	Totem Ocean Trailer Express	N	Y	N
9144914	OREGON VOYAGER	Tanker	30770	45671	1999	Chevron Shipping Co LLC	N	N	N
9353591	OVERSEAS ANACORTES	Tanker	29242	46666	2010	Overseas Shipholding Group	N	N	N
9353565	OVERSEAS BOSTON	Tanker	29242	46802	2009	OSG Ship Management Inc	N	N	N
9475935	OVERSEAS CASCADE	Tanker	29234	46287	2009	OSG Ship Management Inc	N	N	N
9432218	OVERSEAS CHINOOK	Tanker	29234	46666	2010	Overseas Shipholding Group	N	N	N
9351062	OVERSEAS HOUSTON	Tanker	29242	46814	2007	Overseas Shipholding Group	N	N	N
9353527	OVERSEAS LONG BEACH	Tanker	29242	46911	2007	OSG Ship Management Inc	N	N	N
9353539	OVERSEAS LOS ANGELES	Tanker	29242	46817	2007	OSG Ship Management Inc	N	N	N
9353589	OVERSEAS MARTINEZ	Tanker	29242	46653	2010	OSG Ship Management Inc	N	N	N
9353541	OVERSEAS NEW YORK	Tanker	29242	46810	2008	OSG Ship Management Inc	N	N	N
9353577	OVERSEAS NIKISKI	Tanker	29242	46666	2009	OSG Ship Management Inc	N	N	N
9353606	OVERSEAS TAMPA	Tanker	29242	46666	2011	OSG Ship Management Inc	N	N	N
9353553	OVERSEAS TEXAS CITY	Tanker	29242	46817	2008	OSG Ship Management Inc	N	N	N
9408102	PELICAN STATE	Tanker	29527	48598	2009	Crowley Petroleum Service	N	N	N
9486958	PENNSYLVANIA	Tanker	29242	45760	2012	Crowley Petroleum Service	N	N	N
9244063	POLAR ADVENTURE	Tanker	85387	141740	2004	Polar Tankers Inc	N	N	N
9206114	POLAR DISCOVERY	Tanker	85387	141740	2003	Polar Tankers Inc	N	N	N
9193551	POLAR ENDEAVOUR	Tanker	85387	141740	2001	Polar Tankers Inc	N	N	N
9250660	POLAR ENTERPRISE	Tanker	85387	141740	2006	Polar Tankers Inc	N	N	N
9193563	POLAR RESOLUTION	Tanker	85387	141740	2002	Polar Tankers Inc	N	N	N
9002037	R. J. PFEIFFER	Containership	32664	28555	1992	Matson Navigation Co Inc	N	Y	N
9118628	S/R AMERICAN PROGRESS	Tanker	30415	46103	1997	Seariver Maritime Inc	N	N	N

7517698	SEA TRADER	General Cargo	3185	1496	1976	Trident Seafoods Corp	N	N	N
9131371	SEABULK ARCTIC	Tanker	30415	46103	1998	Seabulk Tankers Inc	N	N	N
7816551	SEABULK CHALLENGE	Tanker	29763	49636	1981	Seabulk Tankers Inc	N	N	N
7816549	SEABULK TRADER	Tanker	29763	49990	1981	Seabulk Tankers Inc	N	N	N
7408093	SIERRA	Tanker	64329	125133	1979	Seariver Maritime Inc	N	N	N
8414518	STONE BUCCANEER	Tanker	1576	3549	1985	Stone Oil Distributor	N	N	N
9077044	SULPHUR ENTERPRISE	Tanker	16771	21649	1994	ISC-Sulphur Holding Inc	N	N	N
9408114	SUNSHINE STATE	Tanker	29527	48633	2009	Intrepid Ship Management Inc	N	N	N
7821154	TEXAS ENTERPRISE	Dry Bulk	21734	36414	1981	US United Ocean Services LLC	N	N	N

Appendix III – Statistical Results and Inputs

In these tables, the "Intercept" value of 0.48 along with the lagged liner coefficient of 0.54 means that if all independent variables are set to zero, an equilibrium value of three vessels expected in the U.S.-flag international trading fleet. The t-Statistic is calculated by dividing the Coefficient value by the Standard Error value. The probability of the t-Statistic value for that Coefficient occurring randomly is measured by the Probability value (e.g., there is only a 9.76 percent chance that the Log of Cargo Preference coefficient is attributable to random error). The R-Squared value refers to the fraction of variance in the dependent variable (here, ship numbers) explained by a model, with a value of 1 meaning 100 percent, 0.99 meaning 99 percent, etc. The adjusted R-Squared compensates for the addition of variables to the model.

Table A1: Statistical Fit Data for Log of Liner Estimation Using MSP, ODS, and Cargo Preference Tonnage

Variable	Coefficient	Std. Error	t-Statistic	Probability
Intercept	0.48	1.31	0.38	70.88%
Log of Cargo Preference	0.10	0.06	1.75	9.76%
ODS	0.0040	0.0022	1.80	8.85%
MSP	0.0012	0.0013	0.90	37.96%
Log of Lagged Liner	0.54	0.20	2.71	1.44%
R-Squared	0.940	NA	NA	NA
Adjusted R-Squared	0.926	NA	NA	NA

Table A2: Volumes of Non-Bulk Dry Preference Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons) 1990 to 2023

Year	Food Aid (Packaged)	Packaged Percent of Total	Civilian Agencies	Civilian Agencies Percent of Total	DOD*	DOD Percent of Total	Total
1990	1,048,000	21%	1,038,000	21%	2,910,000	58%	4,996,000
1991	1,371,000	24%	299,000	5%	3,950,000	70%	5,620,000
1992	1,048,000	31%	205,000	6%	2,099,000	63%	3,352,000
1993	1,371,000	29%	1,430,000	30%	1,944,000	41%	4,745,000
1994	1,624,000	45%	359,000	10%	1,648,000	45%	3,631,000
1995	936,000	33%	265,000	9%	1,610,000	57%	2,811,000
1996	750,000	30%	324,000	13%	1,408,000	57%	2,482,000
1997	856,000	31%	473,000	17%	1,437,000	52%	2,766,000
1998	635,000	29%	311,000	14%	1,217,000	56%	2,163,000
1999	1,379,000	47%	231,000	8%	1,334,000	45%	2,944,000
2000	1,493,000	55%	234,000	9%	992,000	36%	2,719,000
2001	1,186,000	48%	292,000	12%	969,000	40%	2,447,000
2002	1,551,000	52%	346,000	12%	1,090,000	36%	2,987,000
2003	1,540,000	45%	222,000	6%	1,677,000	49%	3,439,000
2004	1,555,000	42%	242,000	6%	1,948,000	52%	3,745,000
2005	1,037,000	31%	126,000	4%	2,144,000	65%	3,307,000
2006	956,000	31%	123,000	4%	1,990,000	65%	3,069,000
2007	780,000	23%	120,000	4%	2,422,000	73%	3,322,000
2008	710,000	24%	90,000	3%	2,169,000	73%	2,969,000
2009	915,000	25%	119,000	3%	2,574,000	71%	3,608,000
2010	1,000,000	26%	115,000	3%	2,710,000	71%	3,825,000
2011	613,000	21%	153,000	5%	2,171,000	74%	2,937,000
2012	493,000	21%	217,000	9%	1,613,000	69%	2,323,000
2013 (sequester)	379,000	17%	200,000	9%	1,651,000	74%	2,230,000
2014	379,000	24%	200,000	13%	1,011,000	64%	1,590,000
2015	379,000	23%	200,000	12%	1,080,000	65%	1,659,000
2016	379,000	24%	200,000	13%	975,000	63%	1,554,000
2017	379,000	24%	200,000	13%	975,000	63%	1,554,000
2018	379,000	24%	200,000	13%	975,000	63%	1,554,000
2019	379,000	24%	200,000	13%	975,000	63%	1,554,000
2020	379,000	24%	200,000	13%	975,000	63%	1,554,000
2021	379,000	24%	200,000	13%	975,000	63%	1,554,000
2022	379,000	24%	200,000	13%	975,000	63%	1,554,000
2023	379,000	24%	200,000	13%	975,000	63%	1,554,000
* Note: historically, about 10 percent of bulk cargoes are carried on liner ships. Complete data are not available.							

Table A3: Volumes of Cargo Preference Dry Bulk Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons)

Year	Food Aid (Dry Bulk)*
1990	3,865,000
1991	4,725,000
1992	4,557,000
1993	4,690,000
1994	4,515,000
1995	1,795,000
1996	1,323,000
1997	1,381,000
1998	1,186,000
1999	4,982,000
2000	3,262,000
2001	3,157,000
2002	2,814,000
2003	2,186,000
2004	1,624,000
2005	1,510,000
2006	1,702,000
2007	1,327,000
2008	1,265,000
2009	1,752,000
2010	1,580,000
2011	659,000
2012	1,103,000
2013 (sequester)	691,000
2014	691,000
2015	691,000
2016	691,000
2017	691,000
2018	691,000
2019	691,000
2020	691,000
2021	691,000
2022	691,000
2023	691,000
* Note: historically, about 10 percent of bulk cargoes are carried on liner ships.	

Table A4: Volumes of Cargo Preference Liquid Bulk Cargo Carried on U.S.-Flag Vessels by Fiscal Year (Metric Tons)

Year	Civilian Agencies	Civilian Agencies Percent of Total	DOD	DOD Percent of Total	Total
1990	680,000	9%	6,976,000	91%	7,656,000
1991	117,000	2%	5,896,000	98%	6,013,000
1992	376,000	9%	3,696,000	91%	4,072,000
1993	574,000	13%	3,842,000	87%	4,416,000
1994	588,000	12%	4,179,000	88%	4,767,000
1995	319,000	9%	3,329,000	91%	3,648,000
1996	321,000	9%	3,085,000	91%	3,406,000
1997	287,000	9%	3,027,000	91%	3,314,000
1998	253,000	8%	3,048,000	92%	3,301,000
1999	379,000	6%	6,105,000	94%	6,484,000
2000	478,000	9%	5,087,000	91%	5,565,000
2001	415,000	7%	5,252,000	93%	5,667,000
2002	373,000	13%	2,551,000	87%	2,924,000
2003	435,000	6%	6,395,000	94%	6,830,000
2004	383,000	10%	3,608,000	90%	3,991,000
2005	331,000	6%	4,868,000	94%	5,199,000
2006	354,000	7%	4,866,000	93%	5,220,000
2007	324,000	8%	3,581,000	92%	3,905,000
2008	350,000	25%	1,024,000	75%	1,374,000
2009	364,000	17%	1,768,000	83%	2,132,000
2010	383,000	15%	2,241,000	85%	2,624,000
2011	342,000	9%	3,385,000	91%	3,727,000
2012	427,000	11%	3,481,000	89%	3,908,000
2013 (sequester)	300,000	9%	3,000,000	91%	3,300,000
2014	300,000	9%	3,000,000	91%	3,300,000
2015	300,000	9%	3,000,000	91%	3,300,000
2016	300,000	9%	3,000,000	91%	3,300,000
2017	300,000	9%	3,000,000	91%	3,300,000
2018	300,000	9%	3,000,000	91%	3,300,000
2019	300,000	9%	3,000,000	91%	3,300,000
2020	300,000	9%	3,000,000	91%	3,300,000
2021	300,000	9%	3,000,000	91%	3,300,000
2022	300,000	9%	3,000,000	91%	3,300,000
2023	300,000	9%	3,000,000	91%	3,300,000